



# SCIENCE

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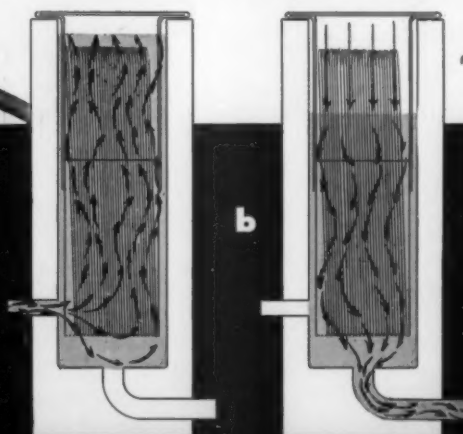
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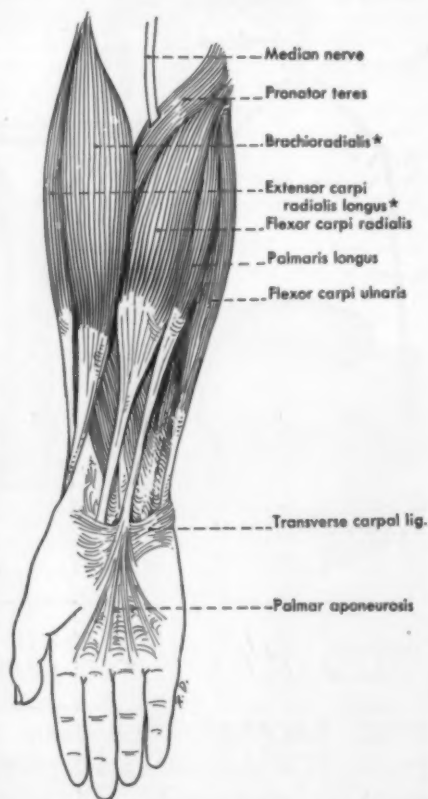
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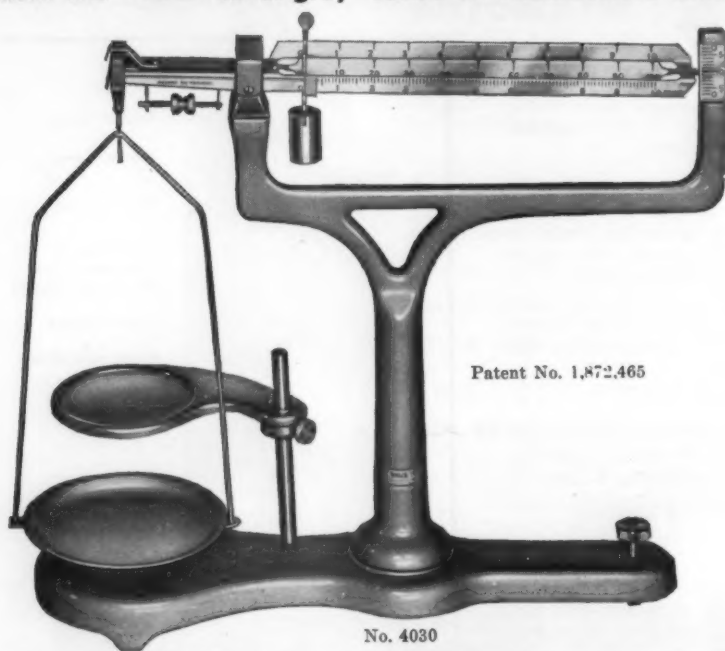
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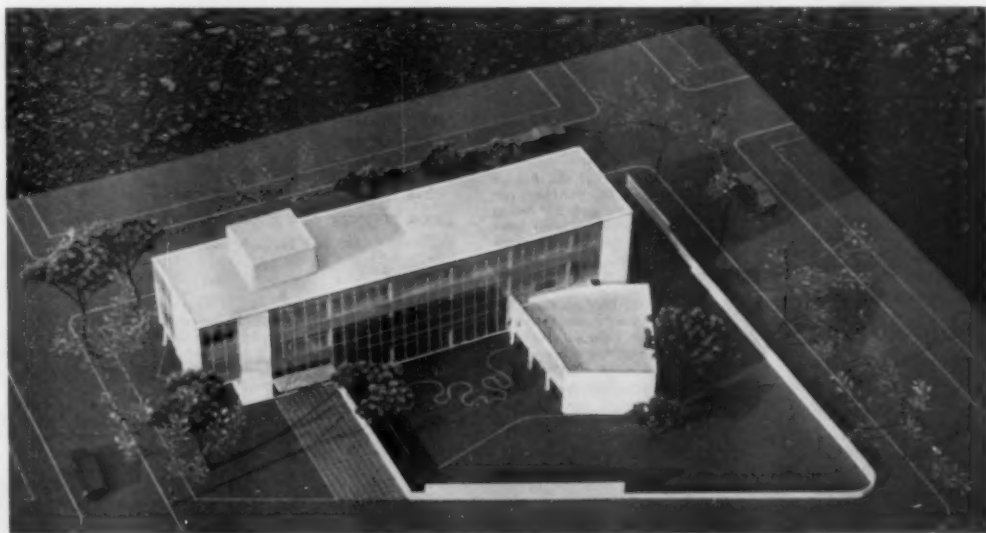
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IN 1946, with the aid of approximately \$100,000 generously contributed by members, affiliated and associated societies, and industrial laboratories, the AAAS acquired its present property on Scott Circle in the heart of Washington. No better location for permanent headquarters could be desired; but funds were exhausted in the purchase of the property, and the Association and The American Psychological Association have been making the most of an old, converted residence. AAAS membership has since increased by 20,000, but the ancient structure that serves as headquarters has not displayed the same capacity for growth as the organization it houses; hence the thoughts of officers and staff have turned persistently to a new building.

Under the chairmanship of Roger Adams, plans for

a new structure have steadily progressed. A proposal to erect an eight-story edifice on the site, to accommodate not only the Association but other organizations, was discarded. Occupancy must be limited to nonprofit organizations, and there are not enough homeless societies to fill such a building. Current thinking favors a functional structure that will house a growing organization, and six sets of plans for such a building are now on hand. Of four submitted by students of Walter Gropius, one is reproduced here. Complete with detached auditorium, such a building will cost approximately \$500,000 at current construction prices. No final selection of plans has been made, nor have steps been taken to raise half a million dollars. Both are projects for—it is hoped—the near future, though realization may be more remote.



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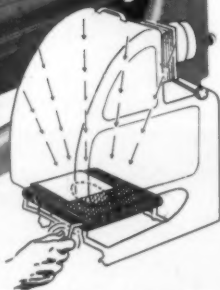
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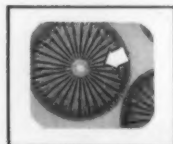
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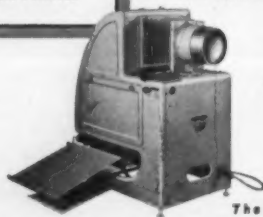
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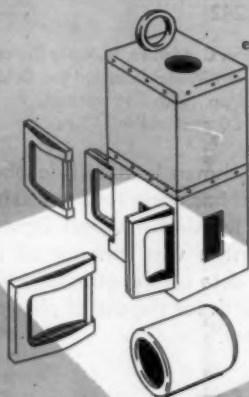


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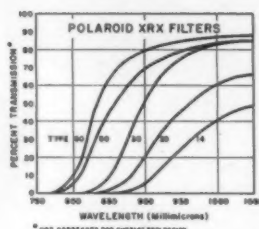
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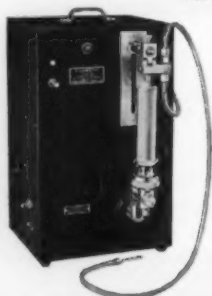
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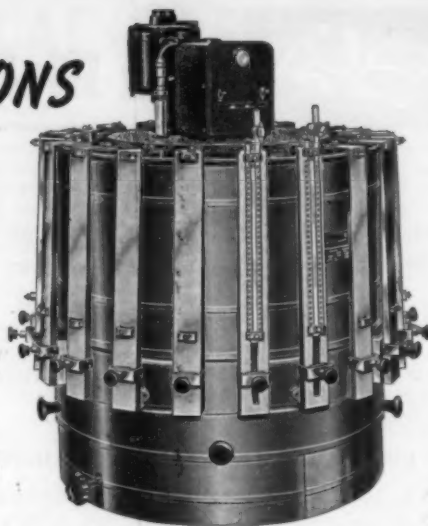


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# Science and Human Affairs<sup>1</sup>

E. C. Stakman

*Division of Plant Pathology and Botany, University of Minnesota, St. Paul*

SCIENCE AND HUMAN AFFAIRS was chosen as the title of this talk because of the importance of the subject and not because of any illusion that the title is novel or of any delusion that I could contribute scientific or philosophic profundities to the elucidation of the subject.

The sciences, scientific methods, and scientific attitudes are of paramount importance in a turbid and turbulent world. In tranquil times ineptitude and error may merely delay the attainment of desired ends, but in critical times they may be disastrous. Science is urgently needed for its contributions to technologies, to wisdom, and to ethics.

The material services of science and technology in times of conflict are so obvious as not to require detailed discussion. They are needed in devising the most effective weapons and defenses. They are needed in the production, processing, and preservation of foods, feeds, fibers, oils, and many other plant and animal products. They are needed in preserving the health and efficiency of human beings, domestic animals, and economic plants. They are needed in efficient industrial production.

Science and technology must be mobilized for national service in times of emergency. Their services are needed in solving immediately pressing problems, in developing materials, processes, machines, and instruments to meet urgent needs. But basic researches are needed also.

There should be no moratorium on basic research, even in times of emergency. Research must provide a reservoir of facts and principles on which procedures can be based when the need arises. Too often we wait until confronted with an emergency, then make an appropriation and demand a miracle. Intensity can be substituted for time only to a limited extent, or not at all, in solving many scientific problems. It is just as wise to provide for "scientific stockpiles" as for stockpiles of critical materials; and the neglect of one can prove just as fatal as the neglect of the other. We need to emancipate ourselves from intellectual naïveté with respect to the miraculous omnipotence of science to repair the wreckage of ignorance by *ex post facto* application of scientific laws. We need perspective; we need wisdom; we need time.

The continuity of science cannot be interrupted with impunity; we pay a heavy price for interrupting basic research. The continuity of scientists cannot be interrupted with impunity; we pay a heavy price for inter-

rupting the development of our most talented young scientists. We need wisdom and perspective in maintaining our scientific strength.

The spirit of science also is needed in a troubled world. We need a rededication to the ideals of truth and justice. We need to remember that science dedicates itself to the discovery, organization, and humanization of truth. We need intellectual integrity, not mere mental cleverness. We need wisdom—knowledge with the capacity to use it; we need clearer perception of objectives and the best means of attaining them; we need perspective in human affairs. We need to apply the rigid standards of scientific truth to the solution of human problems. We need to try to learn, not only how, but also why, people and peoples think, feel, and act as they do. Then we need to put ourselves in their place and contemplate the meaning of the Golden Rule, of a simple code of ethics. We need the scientific method and the scientific attitude in acquiring knowledge regarding human problems; we need to use that knowledge as a basis for wisdom and ethical conduct.

The contributions and the problems of science still are too vaguely and dimly realized. This is evident from the criticisms made by some thoughtful people and by many who are more vocal than thoughtful.

Scientists are charged with accumulating such huge masses of knowledge that they themselves become so bewildered they lack insight and the power of integration, and therefore remain philosophically inarticulate. They are charged with being so preoccupied with the facts of science that they become sociologically irresponsible isolationists. They are charged with concentrating so much on the material that they impede man's spiritual development. These charges deserve examination.

It is true that much effort in science is devoted to amassing knowledge. It also is true that, as science enlarges the area of the known, it is likely to enlarge the area of the unknown even more. The statement is justified but the implied complaint is not. "The more we learn, the less we know" often is true in a relative sense, but it should be changed to read, "The more we learn, the more we realize how much more we want to know or need to know."

The discovery of America established the fact that there were large land areas previously unknown to Europeans. They might have remained content with that fact. But curiosity and desire impelled further exploration, and further exploration revealed a vast field for study in geography, geology, ethnology, zoology, botany.

<sup>1</sup> Based on the address of the retiring president at Cleveland, Ohio, December 28, 1951.

The explorers of America found corn, potatoes, tomatoes, pumpkins, squash, cacao (chocolate), Hevea rubber, Cinchona (quinine), tobacco—a bewildering array of new and useful plants, some of them comprising many types. And Europeans might have remained content to describe these plants, deposit them in herbaria and museums, call them names like *Zea mays*, *Solanum tuberosum*, and *Lycopersicum esculentum*, then congratulate themselves that they had not been guilty of disturbing the *status quo* of botany too much. But fortunately some people wanted to study these plants further; and scientists still are studying them, to satisfy curiosity and to satisfy human needs. Certainly there now are bewildering numbers of varieties of many of these plants, and new and better varieties continually are being produced to meet special soil and climatic conditions, to develop resistance to disease, to improve yields and quality. Acre yields of rubber have increased almost threefold during the past three decades; acre yields of corn in the United States have increased about 25 per cent during the past two decades. And the end is not in sight! There is always more to learn, but also more to eat and wear and to use in many other ways.

And so it is with many scientific discoveries: The structure of the atom, the potentialities within a single cell of a microorganism, the phenomenon of antibiotics, and scores of other discoveries disclose vast fields for investigation to satisfy curiosity and to satisfy human wants. It may be more comfortable to be incurious, but the penalty for stifling curiosity is stagnation and eventual retrogression.

Philosophers and scientists may both be impatient because it takes so long to integrate the vast amount of knowledge that must be accumulated before valid principles can be formulated. And they may be critical because hypotheses often are mistaken for principles, because the validity of principles often is limited by insufficient knowledge, and because principles often must be modified as new knowledge is acquired. But there has been integration. The record of the past hundred years is amazing when we consider the integration of knowledge regarding organic evolution, the laws of inheritance in plants and animals, the application of the law of biogenesis to microorganisms, the cause and nature of fermentation, the causes and nature of diseases of animals and plants, the principles of soil fertility, the structure of matter as a basis for modern chemistry and physics. Whatever the motivation, whether personal ambition, sheer curiosity, or desire to render social service, the contributions of many investigators and inventors were integrated into guiding principles for better understanding and for more effective utilization, for satisfying curiosity and for satisfying human needs and wants.

Are scientists philosophically inarticulate? This has been a recurring complaint since man began to accumulate, organize, and record knowledge. Scientific activity is one phase of man's evolution toward intellectual enlightenment; it is dynamic, not static. This is

both the despair and the hope of science. The time factor is important; modern science is young, and much of the energy of scientists necessarily has been devoted to the solution of practical problems. The discovery and understanding of many phenomena have necessarily waited on man's inventiveness in devising instruments to aid his senses. Advances in microscopy were prerequisite even to seeing microorganisms, the instruments used in atomic research tax the comprehension of most scientists except specialists in the field. It takes time to incorporate the esoteric into the general fund of scientific knowledge. In the past there have been ever-expanding scientific horizons, and what seemed true today has not always been true tomorrow. The validity of generalizations has been limited by available knowledge. Consequently scientists have tried to develop commendable caution. There probably is more scientific history ahead of us than behind us; how much do we know in relation to what evolving man is capable of learning? What is the significance of science in terms of human values? How wisely will man learn to use science and technology? None of us will ever know. How far can and will man evolve intellectually and spiritually? We can hope, and we can hope that we can help, but can we predict?

#### SCIENTISTS AS CITIZENS

Scientists often are charged with being sociologically irresponsible. They are criticized for giving society new knowledge and tools without guaranteeing that society will use them wisely. The charge is true, but the criticism is unfair. Too often society demands service from scientists, then criticizes them for having complied with the demand. "Food will win the war" was one of the principal slogans in World War I. Science and technology went to work to help meet the demand; the record of achievement was good. But a few years later there was "agricultural overproduction," when millions of people in the United States were hungry and the specter of starvation stalked in many areas of the world. The farmer was "a beggar sitting on a bag of gold"—or wheat. Then scientists were condemned for "having shown how to produce more and more without considering how the increased amount could be consumed." Is it necessary to remind ourselves of a similar experience with atomic energy? Scientists now are being asked to help increase agricultural and industrial production and to improve public health in underdeveloped countries. And already their wisdom is questioned because they are "merely helping to aggravate the evils of overpopulation."

Does society expect too much of science? Are scientists to be investigators, inventors, social pastors, and spiritual guides? They are citizens; they are relatively few in number. Do they accept the morals of the society of which they are a part, or do they set their own standards? Presumably most of them do what is required of citizens in times of national emergency. They may try to contribute wisdom, but they

are neither numerous nor noisy enough to determine social decisions. If they are to be blamed for mistakes, they should be given commensurate authority. It would be an interesting experiment.

The charge often is made that science tends to be dehumanizing rather than humanizing, that it substitutes cold reason for the higher faculties, stifles the imagination, suppresses the esthetic and ethical, emphasizes the material and neglects the spiritual, that it hardens and coarsens the spirit instead of softening and refining it. Does the taint of black magic still cling to science as in the days of Pliny, when men were accused of tempting and taunting the gods by piling linen sail upon linen sail until boats virtually flew across the Mediterranean, at speeds that were sure to incur the displeasure of the gods? How often have men been suspect for knowing too much; how often have they paid the penalty for trying to substitute new truths for old errors: Socrates, Friar Bacon, Galileo! The Faust legend of the Middle Ages! Are we still afraid of the truth because it may be disturbing or upsetting?

How can science be dehumanizing when it seeks to discover and humanize truth? And is not cold reason a better guide than instinct, inspiration, and revelation in solving problems of subsistence, health, and industry? Knowledge and skills are prerequisite to the solution of many human problems; we are confronted with realities; all the idealism and beautiful thoughts in the world are pathetically helpless in increasing the productivity of the soil or in preventing devastating outbreaks of disease. Scientists certainly must have the kind of imagination that enables them to formulate hypotheses, and it is a dull scientist indeed whose imagination is not stimulated by contemplating the evolution and development of plants and animals, the vastness of the universe, the almost infinite potentialities of a single cell. Is a mushroom one of the "children of the Gods," a toadstool, a coprophilous basidiomycete, a mycophagist's delight, or an architectural and functional marvel? It can be either or all, but it is the last that can really stimulate the imagination. And the more one studies the mushroom, the more he wonders, and the farther his imagination expands. Scientists may indeed have their fancies; but, as scientists, they must distinguish between facts and fancies; they may have their dreams, but, as scientists, they must realize when they are dreaming; they may have their ideals, but, as scientists, they must distinguish between ideals and objective realities. And it is difficult to understand why search for truth should suppress the esthetic and the ethical. On the contrary, truth often must be the basis for ethical conduct, just as truth must be the basis for justice in a court of law.

The charges against science often are stated in general terms. "We have developed a marvelous material civilization before we were spiritually ready for it, and science is largely to blame." Again, "Civilization is on trial; science is largely to blame; therefore there should be a moratorium on science until man's spirit

can catch up with his intellect and guide it properly."

It would be easy to dismiss the charges against science by asserting that science has emancipated man from the tyranny of ignorance, superstition, and consequent fears of many phenomena; it has emancipated him to a great extent from the tyranny of his physical environment; it has emancipated him from the tyranny of his own physical limitations. Science and technology have enabled man to make his living more easily, to live longer and more comfortably, to make tools, machines, and instruments that enable him to accomplish what he could not otherwise accomplish because of muscular and sensory limitations. And scientists might be justified in asserting, "*Non cum dipteris dorsalibus afflicti sumus.*"

But, like other groups, scientists should periodically practice introspection. They should evaluate their contributions, acknowledge their shortcomings, and improve as much as possible. Has science contributed more to the comforts of civilization than to civilization as a whole; have scientists contributed more to science than to society? Is it true that civilization is on trial, is science at least partly to blame, should there be a partial or complete moratorium on science until ethics overtakes intelligence?

Is civilization on trial? Of course it is. It always has been and probably always will be, until mankind reaches Utopia and adapts himself to it. Civilization is not a guided missile powered by wishful thinking, controlled by pious platitudes, and predestined to carry mankind with it to the acropolis of Elysium, there to flower and flourish eternally, free from all tribulations and temptations, and immune from all assaults by the forces of ignorance and evil. Civilization is a stage in the evolution of mankind toward intellectual enlightenment and spiritual refinement. As measured at any given time and place, it is a stage in the evolution of groups of men. It comprises multiple phases and is affected by multiple factors and forces. It is guided by human intelligence, human emotions, and human will. Its goals and guideposts are set by men, and vary in time and place. Its limits are set by man's capacity to evolve intellectually and spiritually; by man's determination and ability to understand and master his environment, and by his ability and determination to master himself; by man's ability and determination to develop and utilize science and ethics; by man's concepts and his philosophy. As long as man continues to evolve there can be no statute of limitations on the trials of civilization.

The trials of civilization are due partly to man's myopia. Too often we see neither the past nor the future clearly. Consequently, we think that civilization is retrogressing because we see the past only dimly. We lack historical objectivity and perspective and, therefore, fail to profit by the lessons of the past. We lack wisdom with respect to the future. Too often we fail to reckon the consequences of acts. The realization of new ambitions is all too often incompatible with the preservation of cherished values. The conse-

quences of acts often are inexorable, and we must bear the consequences. Then we blame civilization, as if it were the culprit, because we have lost what we have thrown away in the attainment of our ambitions. This is a recurring complaint in history. Periodically, thinkers have realized also that there was not parallel development in intelligence and in ethics. The statement of John Fiske that "There has been more progress in intelligence than in kindness" may be true even today. But is it not equally true that there has been too little development in wisdom, as well as in kindness? Civilization is again in a critical period of trial. Is science to blame?

#### A MORATORIUM ON SCIENCE?

Whatever its shortcomings, science alone is not to blame for the trials of civilization. We are neither wise enough nor good enough to live the way we would like to live. All the factors and forces of civilization have not enabled us to reach the goal. Perhaps "There has been more progress in intelligence than in kindness." But would ignorance make us kinder; and would kindness make us wiser? Would it be wise to become more ignorant in the hope of thereby becoming kinder and wiser? Should there be a moratorium on science until the spirit can overtake the intellect?

Before thoughtlessly or flippantly advocating even a partial moratorium on science, we should at least muster enough wisdom to reckon the consequences.

What have been the consequences of moratoria on science? The inhuman results of the classic blackout of science during the Dark Ages are known to every casual student of history. Overconcentration on what were conceived to be spiritual values and almost complete neglect of a naturalistic and rational attitude toward problems of living led to such stagnation and retrogression in science and technology that filth and squalor and disease were considered inevitable. The terrible epidemics of the black death decimated populations and filled life with horror and dread. And the remedy was to burn to death the nonconformists. Surely ignorance did not increase kindness; it aggravated man's inhumanity to man.

But it is not necessary to go so far afield either in time or space to see the consequences of lack of science. There are countries now, in the Western Hemisphere, where agricultural production has been so low that acre yields of corn were 39th of the 45 countries for which data were available; where the yield of wheat was 59th in a list of 62 countries; where meat consumption was 40 pounds per capita, as contrasted with 150 in the United States; and where sugar consumption was 35 pounds as contrasted with 100 in the United States. Respiratory diseases were 8 times as prevalent, enteric diseases 15 times as prevalent, and malaria 45 times as prevalent as in the United States; and the death rate was higher than our birth rate. Science and technology already have begun to alleviate these conditions. Does the solution of such problems merely aggravate the population problem? Do we

recognize the reality and the tragedy of hunger and disease, of physical and mental suffering and despair? Is it dehumanizing to alleviate human suffering; are the scientists who help in the alleviation sociologic isolationists, whether they contribute directly or indirectly? Virtue, instinct, inspiration, the so-called higher faculties, cannot solve such human problems. Knowledge, skills and materials, cold reason, are needed. To solve such problems more science and technology, not less, are needed, even though more than science may be needed.

The need of science is greater than ever, because the world is figuratively smaller and actually much more crowded than ever before. Human problems, therefore, are more complex, and more intelligence and ethics are required to solve them.

Science obviously must contribute to improved technologies in an industrial world—better synthetic rubber, better synthetic fibers, more efficient engines. More science is needed in the field of human health. Cancer, arthritis, brucellosis, poliomyelitis, virulent types of influenza, the common cold, still are defiant to medical art. Perhaps something could be done about premature senility and persistent puerility, also. Science is needed in solving problems of human subsistence: when two thirds of the world is poorly fed and part of the remainder is overfed, we need to put science and ethics to work. When we profess the brotherhood of man and cannot act the part and do not know why, we should at least make the attempt to put science to work in studying human relations.

The importance of science and of scientific attitudes in international affairs, as well as in national affairs, is recognized by the United Nations. Whatever its fate as a governmental organization, it is encouraging that such an organization recognizes problems of health, subsistence, and social organization as international problems. Science and technology must contribute to the welfare of peoples, not merely to that of some nations. The mutual contributions of science can help toward international understanding; the recognition of mutual problems can lead to international cooperation; and the mutual benefits derived can help promote international prosperity and peace. The establishment of the World Health Organization, the Food and Agriculture Organization, and the Educational, Scientific, and Cultural Organization of the United Nations is evidence of good intent. But what can really be done? The total annual contribution to Unesco from more than 50 nations is scarcely enough to maintain a regiment of infantry in a modern army! What can be done to improve education, cultural standards, and scientific competence with this pitifully small sum? What impact can these organizations have even if they recognize the problems, analyze them objectively, recognize the inexorability of facts and the stubbornness of situations, and emphasize that permanent solutions of complex human problems are neither quick nor easy? Analysis of the problems and indication of the knowledge and skills required to solve them



are only the first steps. The will to use the knowledge and skills, the implementation, must still be the responsibility of governments. There is need for competence, determination, persistence, faith, tolerance, charity. Can scientists and humanists furnish them, or do they need help? Point Four? What are the problems? Two of the most important are those of human subsistence and of human relations.

The problem of human subsistence is old but important. Ever since Adam and Eve were expelled from the Garden of Eden for being poor pomologists, man has been eating his bread "in the sweat of his face," or, as Virgil expressed it in his *Georgics*, somewhat more elegantly but less pungently,

The Sire of gods and men, with stern decrees  
Forbids our plenty to be earned with ease  
But wills that mortal men, insured to toil,  
Should cultivate with pain the grudging soil.

Not only is the problem of subsistence old, but it often has been a determining factor in war or peace. Ever since Malthus formulated his doctrine that population tended to increase faster than food supply, there have been periodic fears that population actually would exceed food supply. It frequently is pointed out that the future of civilization, indeed of man himself, will depend on the amount of energy he can get for food and fuel. Nearly all the energy man now uses is solar energy, some replaceable, some not. The irreplaceable stored energy is in coal, oil, and natural gas. The replaceable energy is made available by plants, but this is less than 30 per cent of the total being used. Plants are basic to human subsistence; and agriculture is the most basic of all industries in a real sense. Soil and water, then, are the most essential basic resources, and the number of people that can live in the world will depend on the intelligence and skill with which man uses them.

Is the world approaching population saturation? Opinions differ. There are roughly 36 billion acres of land, of which 10 billion or less may be suited to some kind of agriculture or forestry. Most of the best lands are, however, already in use; and much that could be cultivated would have to be irrigated, cleared of forests, drained, or fertilized heavily. The population of the world is about 2.25 billion and is increasing at the rate of about 20 million a year. It takes about 2 or 2.5 acres to subsist one individual, depending on the standard of living and efficiency of production. With the amount of good land definitely limited, the population cannot increase indefinitely, as about 500 million acres of additional land are now needed every decade. But how much can productivity of land and water be increased? Will it always require as much as 2 acres to subsist one individual?

How much could an acre of land produce if all the knowledge and skills now available were applied? And how much more can an acre produce 25 years from now if science is put to work on the problem? How much can soil productivity be increased? What is the maximum combination of genes for yield in the prin-

cipal crop plants? What is the maximum combination of genes for efficiency and total production in domestic animals? What is the maximum combination of genes that nature may combine in pathogens of crop plants and domestic animals? It would be wise to organize and support skyscraper projects to investigate the potentially maximum agricultural productivity. Where is the wisdom; where are the funds?

Since we are so dependent on solar energy, will we always be dependent on plants to utilize it for us? Is artificial photosynthesis possible? Can atomic energy be substituted for some of the stored solar energy that is now being used so inefficiently? Is there a way of using a higher percentage of the energy? Can science emancipate us from present dependence on so few sources of energy?

Whatever the future fate of man in his struggle for subsistence, there are acute and perplexing problems of the present. Land is badly distributed. None of the countries of western Europe has enough land to subsist its population. The amount per capita ranges from about 0.5 in Belgium, about 1 in Italy and pre-war Germany, to 1.5 in France. The situation in Asia is even worse. Java has only about 0.5, China about 0.75, Japan only 0.25. The United States has about 3 times as much agricultural land as Germany and Italy, 4 times as much as China, almost 7 times as much as Java, and about 13 times as much as Japan.

What alternatives have countries with too little land? They can reduce their standard of living, increase agricultural efficiency, industrialize and trade, reduce population, live on charity, starve, or swarm and kill or be killed. Some countries still can choose one of the first three alternatives; some, like Japan, are restricted to the last three. It does not solve the problem of overpopulation to say that it never should have come into existence. It does exist, and it must be faced. The problem is basically biological, although its basic nature often is obscured. There is a tendency for biological entities to swarm when they press too heavily on means of subsistence. This is true of potato bugs and grasshoppers, of wolves and human beings. The struggle for existence is not restricted to lower organisms; nor are the uglier aspects of the survival of the strongest restricted to them.

What can science contribute to the solution of problems arising from maldistribution of people and resources? It can insist on objective analysis of the problem; it can help solve the biologic and technologic problems involved, within the limits imposed by nationalism. But it cannot, under present conditions, solve the political problems involved. For nationalism often is epistatic to science, to ethics, and even to religion. Science has solved many problems of man in relation to his physical environment, but it has not succeeded in emancipating man from his baser self, from man's cruelty to man. Can science contribute to better human relations?

Can there be a science of human relations? Is man really capable of understanding and mastering him-

self? Can he be objective regarding himself and the group of which he is a part? And does he want to; do men still thrive on their prejudices? Can the social sciences discover, organize, and apply facts and principles in social affairs? There are obstacles, because the emotions play a far greater role than in the natural sciences. As Bacon wrote, "Numberless in short are the ways, and sometimes imperceptible, in which the affections color and infect the understanding." In social affairs man encounters his presuppositions, preconceptions, prejudices, selfishness, greed, group consciousness, and narrow nationalism. The social scientist has a difficult time: is he to be investigator, advocate, and guide? What penalties does he pay for unorthodoxy? What influence can he exert on courses of action?

#### THE ULTIMATE GOAL

Can insistence on a scientific attitude gradually help substitute facts for fancies; principles for prejudices; education for propaganda; intellectual integrity for mental cleverness; statesmanship for partisan politics; broad humanitarianism for tribalism; the Golden Rule for the law of the jungle? Can science help human beings act the part? Can it contribute both to wisdom and to ethical conduct? This should be the ultimate goal of science.

What does science need if it is to render its maximum service in human affairs; what are the motives: personal ambition, curiosity, social service? Was Mencken right when he wrote, "The prototype of the scientist is not the Good Samaritan but a dog sniffing tremendously at an infinite series of ratholes"? Was Huxley right when he said, "Nothing great in science has ever been done by men, whatever their powers, in whom the divine afflatus of the truth-seeker was wanting"?

Science does or should dedicate itself to the discovery and humanization of truth. There naturally is and must be a division of labor: Discovery, dissemination, application. But there must be coordination also.

Science cannot contribute its full share to progress unless there is increased understanding by society of the complexity of many problems and what it takes to solve them. Nor can it function best unless there is cross-fertilization between pure science and applied science and technology. Some investigators must concentrate on the solution of problems, but many must

be free of the restrictions of "assigned research." And there must be freedom from bureaucracy, national authoritarianism, and myopia. Scientists should not claim special privileges for themselves but for science, in order that it may contribute most effectively to social welfare.

Science justly claims certain privileges in order that it may function efficiently. But it has obligations also. Science must continue to satisfy human wants, to contribute to the comforts of civilization. But it can and should contribute to intellectual enlightenment and spiritual refinement, to wisdom, and to ethics. The facts of science, the skills and techniques of science are important, but in education, in human affairs, is the spirit of science not equally important? Science is a humanizing agency but not the only one. Science must not become authoritarian and intolerant. There should be a moratorium, not on science, but on the mutual disrespect that certain groups of scientists still have for each other. Each group contributes in its own way. And, above all, there should be a moratorium on the misunderstandings and conflicts between humanists and scientists. The factors and forces affecting the evolution of man are varied and they vary with individual men and individual groups. "*Es irrt der Mensch so lang er strebt*" is as true now as when Goethe wrote it. But combined effort may reduce the number of mistakes.

A moratorium is needed, but it is a moratorium on the conflict between science and the humanities. For science, religion, music, art, history, literature, have values in the degree to which they make men happier, wiser, and better. The value of each varies with individual men. All are valuable insofar as they illuminate the intellect, refine the spirit, and stimulate useful and ethical conduct. To promote truth, wisdom, and justice is not the prerogative of any one guild. The factors and forces in the evolution of the human intellect and spirit are varied and complex; and it is unscientific and unethical to deny to each its fair share of credit for its contributions.

Humanity needs both the sciences and the humanities; both are humanizing to the extent to which they humanize. There is need for more understanding and tolerance between scientists and humanists; properly motivated, all are humanists and their joint contributions can accelerate man's evolution toward intellectual enlightenment and spiritual refinement.





# Detlev W. Bronk, Scientist

Milton O. Lee

*The American Physiological Society, Washington, D. C.*

THE SELECTION OF DETLEV W. BRONK as president-elect of the American Association for the Advancement of Science is a particularly suitable one. The Association stands for the integration and essential unity of science in an age in which the intense demands for intellectual specialization impose such difficulties for most men that few achieve the nicety, depth, and breadth of understanding to merit the appellation of Scientist without qualification to a single field. It is refreshing evidence of the discernment of the AAAS that it recognizes and acclaims such a man in Detlev Bronk, and that it asks him to give of his talents for its guidance.

Only a few of the more pertinent biographical facts about the president-elect can be mentioned here. He was born on August 13, 1897, in New York City, the son of a distinguished Baptist clergyman, Mitchell Bronk, and Marie (Wulf) Bronk. After his undergraduate education at Swarthmore College, where he majored in electrical engineering, he worked briefly as a power engineer and then, in late 1921, entered the graduate school and the teaching of physics at the University of Michigan. Here he earned the M.S. degree in physics in 1922 and the Ph.D. degree in physics and physiology in 1926. Returning to Swarthmore, he advanced rapidly to the posts of professor of physiology and biophysics (1928-29) and dean of men. At this point of his career there occurred a fortunate circumstance which contributed much to his development, and which deepened the springs of his own inspiration. He was awarded a National Research Council Fellowship and spent a year at Cambridge and London, where he worked with E. D. Adrian and A. V. Hill. The close friendships which he formed with these men have continued through the years. With the preparation he brought to his work at Cambridge and the research he undertook there he committed his personal research activities to the basic problems of neurophysiology. He returned to the University of Pennsylvania to organize and direct the Eldridge Reeves Johnson Foundation for Research in Medical Physics, and to direct the Institute of Neurology.

From this point Bronk's towering ability in administration has been rapidly recognized and called upon by many institutions and agencies. He was coordinator of research in the Air Surgeon's Office of the Army Air Force (1942-46); chief of the Division of Aviation Medicine, Committee on Medical Research of the OSRD (1944-46); member of the U. S. Commission for UNESCO (1946-). He was chairman of the National Research Council (1946-50) and carried that organization to new peaks of accomplishment rather than allowing it to settle into a postwar lassitude. He

was elected president of the National Academy of Sciences in 1950 to succeed A. N. Richards, and is currently engaged in bringing that body and its operating arm, the NRC, into more effective internal relationship. He is one of the small number of American members of the Royal Society of London. In 1948 he was named successor to Isaiah Bowman as the sixth president of The Johns Hopkins University. He was named by President Truman in 1950 as a member of the Board of the new National Science Foundation and was made chairman of its Executive Committee by that board.

This partial list of Dr. Bronk's heavy responsibilities in science and education is evidence of the recognition of his extraordinary abilities, but it does not disclose the essential qualities of the man which cause these responsibilities to be brought to him. It can correctly be inferred that his acquaintance and friendships among scientists and educators are extensive, that his knowledge of many fields of science is remarkable, and that he has rare ability and wise tact in handling difficult as well as simple situations. He has also a high degree of awareness of the subtleties of situations and problems; a chemist, geologist, physicist, or biologist in talking with him finds a common understanding of these small but important factors. His ability to keep administrative details in line with principles, his sense at foreseeing necessary compromises and of formulating acceptable ones, and especially his ability to inspire both confidence and vision in his associates—these are some of the qualities of his leadership. Scientists, like other men, do not live by bread alone and give their highest loyalties to those who supply sustenance of the spirit.

Bronk regards himself primarily as a physiologist; he regards physiology as the integration and synthesis of physics, chemistry, and mathematics in the study of life processes. He disclaims being a founder of the field of biophysics, pointing out that Galvani was a biophysicist two hundred years ago, but he has been foremost in establishing biophysics as a recognized discipline. He is still a productive researcher and each year publishes papers on nerve impulse conduction, oxygen metabolism and enzyme systems of nerve, and other aspects of neurophysiology. He still continues two editorial responsibilities—as managing editor of the *Journal of Cellular and Comparative Physiology*, and as associate editor of the *Review of Scientific Instruments*. His recreations include mountain climbing, sailing, and attention to his farm in Pennsylvania. When asked how he can accomplish as much work as he does, he has replied, "I don't work at all; I only do the things I like to do!"

# Agenda for 1951

Kirtley F. Mather

*Department of Geology, Harvard University, Cambridge, Massachusetts*

THE PRESENT IS ALWAYS A DIVIDE between the past and the future, but the transition from the first to the second half of the twentieth century constitutes a watershed of extraordinary prominence. The events of 1950 have forced upon us the necessity for making a complete reappraisal of the relation of scientists to the future of America and the rest of the world during 1951 and subsequent years. The routine administration of the AAAS and the development of its well-established program will continue throughout the year, we hope, along the lines so ably set forth by my predecessor, Roger Adams, a year ago (*Science*, 111, 129 [1950]). But no member of this body, representing as it does all aspects of modern science—physical, biological, and social—can escape the obligation to reconsider his program and personal commitments as he seeks to fulfill his duty to his science, his country, his fellow-men the world around, and perhaps most of all to his own best self.

Never before in the history of America have science and scientists been confronted with such grave dangers as those coming to the fore in 1951. Seldom if ever has it been so difficult for men to make wise decisions, to chart with confidence the road ahead. The pendulum of public opinion concerning scientists swings erratically from an extreme of adulation and awe, because of spectacular contributions to industrial developments, military materiel, and human health, to another extreme of suspicion and recrimination, because of new weapons of mass destruction and the obvious responsibility of science for swift and far-reaching changes in human relations that characteristically bring fear, suspicion, and greed in their train. The scientist himself is troubled by the twin ogres of concentrated power, competent to destroy even civilization itself, on the one hand, and the prospect, on the other hand, that any large group of persons may gain for themselves a high standard of living if they are able to use the skills, techniques, and implements that research has made available. The Frankenstein of potential abundance for all is just as ominous in the minds of many as the Frankenstein of widespread destruction of life and property.

Against that background there stands the stark reality of current events. The mobilization of American manpower, necessary for national defense, poses difficult problems to those who strive to find and apply wise principles of conservation of human resources—using the term conservation in its best and truest sense. (Here it would seem to me to be wise to make our plans in accord with the hypothesis that we are in for a long-drawn-out period of partial mobilization with a continuing state of extreme international

tension, rather than that complete mobilization will promptly be required for the catastrophic explosion of global war.) Be that as it may, it would be folly not to take thought for the latter half of the decade of the fifties, because of hysterical anxiety for the first half of that interval.

The executive officers and Council of the AAAS have wisely proclaimed the nature of a guiding compass for the nation's representatives with respect to this particular problem. A resolution adopted at Cleveland affirms "that it would be a national calamity not to make maximum use in the present emergency of the scientific and technical skill possessed by our trained personnel, and that it would be equally calamitous not to assure an adequate continuing supply of such trained personnel." To this the members of the Council in attendance at the Cleveland meeting added the further suggestion that "universal national service for scientists is preferable to universal military service and that all scientific personnel should be allocated to such national service as their individual training and skills, as well as national needs, permit." Thus, scientists and scientists-in-training would be assigned to specific civilian or military duties, rather than deferred from immediate military duties. This is the program for which the executives of the AAAS will work, as opportunity develops, but little can be accomplished unless a large percentage of our members exert all the influence they can, both upon public opinion and upon their representatives in Congress.

It is by no means a foolproof program to meet both the emergency and the long-run requirements for national welfare, nor are its numerous operational details spelled out in regulatory proposals. Presumably there would be widespread agreement among scientists that assignments should be made by civilian boards on which adequately qualified scientists had effective representation. Likewise, every effort must be made to ensure safeguards against the regimentation of the youth of our land in ways analogous to those of the totalitarian autocracies whose methods we abhor. The crux of the matter is, however, the general recognition of the fact that service to one's country even in time of mobilization for survival involves much more than the commitment of the physically fit to the grim task of mounting military force to meet the foe. In raising the sights of their countrymen, the scientists of America may make a contribution to human progress of inestimable value.

Of equal significance is the next item on our agenda. Science in America is seriously imperiled by rapidly increasing efforts to restrict the freedom for communication of ideas that is the very lifeblood of science itself. Security through secrecy has become

the utterly fallacious but eagerly accepted watchword of the day. Unnecessary restrictions placed upon exchange of scientific and technical information are already a roadblock on the highway of scientific achievement. Those of us who understand how essential freedom of thought and freedom of expression are to scientific progress, as well as how essential scientific progress is to national survival, must be alert and courageous to expose and thwart, if possible, the repressive measures rearing their ugly heads in so many quarters. Eternal vigilance is still the price of liberty. Freedom for the scientist to continue his research and his exchange of information and ideas with his fellow-scientists, untrammelled by fear, unlimited by military directives, unrestricted by senseless regulations, should be demanded for the good of the whole nation.

It is not easy to draw the line between information that should appropriately be kept under security wraps and information that should flow freely from man to man and place to place. The difficulty has increased rapidly in recent years, as war inevitably becomes total war, involving all aspects of the economy. But every informed scientist must know how grievous are the errors of judgment that have been made in the effort to play safe for security rather than to play safe for scientific progress. Is it too much of a hazard to assert that scientists are just as loyal and just as trustworthy as lawyers or business executives? The fact is that many more "military secrets" have been revealed by members of Congress in the past few years than by the scientists responsible for the development of new weapons or techniques. To secure just treatment and demand fair play for men of science may well be among our primary objectives.

Especially important here is the preservation of the

international character of science. The Department of State has been exercising increasing control upon the movements of American as well as foreign scientists, both in and out of our country. The power to withhold passports and visas is a power which, when improperly used, may deal a serious blow to scientific progress. International gatherings of scientists are in grave danger of serious curtailment, both in America and abroad, because of the establishment of political and ideological tests of fitness to travel across national frontiers. The scientists of America must insist upon the recognition of the fact that science knows no political frontiers and that its concepts are either worldwide in their application or of no validity at all. The AAAS will continue during 1951 to work for the greatest possible freedom, consistent with intelligent principles of national security, for the unrestricted flow of ideas among the peoples of all nations.

All of which is to say that as we move forward into the second half of the twentieth century it becomes the imperative duty of every member of the AAAS to accept his responsibilities and exercise his rights as a citizen in a still relatively free society. Each of us must become "a scientist with a social conscience." Men of intelligence and goodwill, if aroused to the grave dangers and glorious opportunities of the new day in human history, may yet exert such an influence upon domestic and foreign policies as will greatly increase the chances of establishing a just and durable peace so that we shall not tumble stupidly over the precipice to destruction in another World War. Strenuous efforts to direct the application of the intelligence of science to human affairs, in ways determined by the spirit of brotherly love for all men everywhere, should have top priority on our agenda for 1951.



Dr. Mather and Dr. Bronk at the AAAS Meeting in Cleveland, Ohio, last December.

# A Report of the Cleveland Meeting December 26-30, 1950

Raymond L. Taylor

Assistant Administrative Secretary, AAAS

**T**ECHNICALLY, the 117th Meeting of the American Association for the Advancement of Science opened the morning of Tuesday, December 26, 1950, with the beginning of registration and the holding of the first scientific session—on astronomy, arranged by Section D. A great deal of planning and preparation, by a great many people, in an impressive variety of occupations, had culminated in the unlocking of the doors of the Cleveland Public Auditorium.

At noon the largest and most diversified Annual Science Exposition the AAAS has ever held was opened. At 1:30 P.M. the first program of the Science Theatre began on schedule, and soon thereafter the sessions of several other sections, and the first part of an Association-sponsored symposium on Science and International Understanding, were called to order.

The final event of the five days was the evening address of the Academy Conference, "The Emperor's New Clothes, or *Prius Dementat*," given by Professor H. J. Fuller, who had been invited to repeat the address he had given as retiring president of the University of Illinois Chapter of Phi Beta Kappa.<sup>1</sup>

Between the first and last events there were 211 sessions, meal functions, and public lectures. There were no less than 27 symposia sponsored by the Association and its sections. Though the last four days were full, there were relatively few conflicts of programs in the same field—and when there were any, it was possible to go from one room to another in the same building.

Officially the 117th Meeting is over—but no great conclave of scientists in diverse fields of science can be without stimulating effects that will continue indefinitely. Though not as large as the exceptional, record-breaking New York meeting of 1949, the Sixth Cleveland Meeting was one of the best-balanced, and it afforded an opportunity for specialists in all the principal fields of science to meet in joint programs and to discuss informally those problems that all scientists have in common.

*Planning the meeting.* Those who attend the sessions of a large scientific meeting, unless they have shared the experience of making some of the arrangements, may not be in a position to appreciate the amount of planning and work that goes into the smooth functioning of all sessions. The cooperation and service of many individuals are utterly essential. The convention city is decided upon, usually several years in advance, and only after a preliminary survey indicates that the physical facilities are adequate and satisfactory. The decision to meet in Cleveland was made in the summer of 1949, after 2,500 sleeping rooms and all necessary public space in the hotels had been guaranteed. Early in February, all meeting rooms were checked for capacity, provisions for darkening, public address systems (if necessary), locations of electric outlets and switches, the number of obstructive pillars, and furnishings.

Very early in the spring, the secretary of each section

<sup>1</sup> This amusingly presented but thought-provoking classic was published in *THE SCIENTIFIC MONTHLY* for January 1951.

and society must estimate the probable number of sessions and the expected attendance at each. Soon afterward, headquarters hotels for related societies are decided upon, and meeting rooms assigned in as logical a manner as possible. At Cleveland, the Hollenden was the only feasible choice for the multiple sessions of the five zoological societies, and the Statler for the three science-teaching societies and related sections I and Q. Most of the sectional programs which, from prior experience, were expected to draw large audiences, were placed in the large meeting rooms of the Public Auditorium; the public lectures and other special sessions in the evening necessarily were divided up among the Auditorium and the hotels. With no hotel more than eight blocks from the Auditorium, the meeting, potentially, was a most convenient one. The extra cold weather, however, caused some inconvenience.

*Local committees.* The aid of key citizens of the community that has invited the Association to convene must also be enlisted early in the year, if the meeting is to be a success. In Cleveland, the AAAS and all who attended the meeting are indebted to an exceptional group of local committees under the active direction of General Chairman Charles J. Stilwell, president of the Warner & Swasey Company.

To Mr. Stilwell, to each of the following, and to all members of their committees, the Association expresses its grateful appreciation: The *vice chairmen*, T. Keith Glennan, president of Case Institute of Technology, and John S. Millis, president of Western Reserve University; Leslie E. Frye, director, Division of Visual Education, Cleveland Board of Education, *chairman*, Equipment and Projection Committee; James H. Rand III, president, J. H. Rand and Associates, *chairman*, Exposition Committee; Allen T. Perry, procurement manager, Harshaw Chemical Company, *chairman*, Finance Committee; David Dietz, science editor, Scripps-Howard Newspapers and the *Cleveland Press*, *chairman*, Publicity Committee; and Bruno Gebhard, director, Cleveland Health Museum, *chairman*, Tours and Entertainment Committee. These local committees contributed time, thought, and effort, and they worked together to an unusual degree. Their assistance was invaluable in making the 117th Meeting a memorable one.

*Attendance.* The attendance was lighter than had been expected, a condition especially regrettable in view of the excellence of the programs and the calibre of the record-breaking Annual Science Exposition. The meeting was better attended, actually, than was realized at the time—as the figures given here indicate. Attendance was conspicuously low on the first and second days. The principal factor was the severity of the weather, with its combination of snow and subzero temperatures. Trains from the East ran from three to six hours late; many flights from Eastern cities were cancelled; and snow-covered highways discouraged many of those who had expected to drive from points in Ohio and nearby states. The serious international situation, which has imposed new responsibilities



on many scientists, had its effect, and, besides, some of the biologists—e.g., the geneticists, botanists, and horticulturists—who usually meet with the AAAS, met under AIBS auspices in Columbus, Ohio, in September. This may have reduced attendance by 500 or more.

Registrations at Cleveland totaled 2,354, and every state was represented, with the sole exception of Nevada.<sup>2</sup> Particularly gratifying were the numbers from such distant areas as the Far West, the Gulf States, and New England. Complimentary admission tickets to the Exposition, supplied to local professional people upon request, totaled 3,690. Including additional hundreds who attended the large public lectures (there were about 1,800 in the Music Hall of the Auditorium at the National Geographic Lecture), at least 6,500–8,000 persons attended one or more events of the Association's 117th Meeting.

TABLE 1

DISTRIBUTION OF REGISTRANTS BY STATES

Ohio	787	Georgia	13
New York	232	Louisiana	12
Pennsylvania	159	Kentucky	11
Illinois	152	Rhode Island	10
Michigan	140	Oklahoma	9
Indiana	83	Delaware	8
Massachusetts	80	Florida	7
Maryland	79	South Dakota	6
Distr. of Columbia	64	Vermont	6
New Jersey	48	Mississippi	5
Wisconsin	41	South Carolina	5
Virginia	40	Washington	5
Tennessee	35	Alabama	4
Iowa	31	North Dakota	4
Minnesota	31	Montana	4
Texas	26	Oregon	4
Missouri	24	Wyoming	4
California	24	Arizona	3
Kansas	21	Arkansas	3
Connecticut	20	Colorado	3
North Carolina	19	Maine	3
Nebraska	15	New Mexico	3
New Hampshire	15	Idaho	1
West Virginia	14	Utah	1

Hawaii was represented by two registrants.

DISTRIBUTION OF FOREIGN REGISTRANTS BY COUNTRIES

Canada	32	Guatemala	1
Australia	1	Japan	1
Germany	1	Venezuela	1
Greece	1		

The subject fields of those who registered are not as readily analyzed as are their geographical data. Some listed as a field of interest a restricted research specialty, whereas others named two or more major sciences (in which case only the first was tabulated). The scientific fields of the 2,354 registrants are grouped in Table 2 under Sections A–X.

The complimentary admission tickets to the Annual Science Exposition were distributed only to those who requested them. In advance of the meeting, members of local societies of chemists, engineers, dentists, and other professional groups were invited to write in for tickets for themselves and the adult members of their families. Every physician in Ohio, for example, received this invitation. Just before the Exposition opened, in the press and on the radio, those interested in the Exposition were

<sup>2</sup> The data for previous Cleveland meetings are: September 1944 (wartime conditions) 1,035; December 1930, 2,635; December 1912, 870.

TABLE 2

REGISTRANTS' FIELDS OF INTEREST

A—Mathematics	48	H—Anthropology	20
B—Physics	153	I—Psychology	86
C—Chemistry	209	K—Social and Economic Sciences	40
D—Astronomy	13	L—History and Philosophy of Science	9
E—Geology and Geography	24	M—Engineering	58
Geography	78	N—Medical Sciences	17
Geology	11	Bacteriology	18
Speleology	25	Dentistry	22
F—Zoological Sciences	14	Endocrinology	8
Embryology	4	Nutrition & Food Technology	28
Entomology	127	Pharmacy	62
Herpetology	22	Physiology	26
Histology	295	Radiobiology	135
Parasitology	265	Other Medicine	23
Protozoology	16	O—Agricultural Sciences	126
Zoology (all other divisions)	37	Q—Education	27
FG—Biological Sciences	16	X—Science in General	
Biology	6	Nature study and conservation	
Cytogenetics (including Cytology)	61	General, miscellaneous, or no field stated	223
Ecology			
Genetics			
Limnology and Oceanography			
G—Botanical Sciences			

invited to apply in person for complimentary tickets. Exhibitors were given tickets to distribute to their key customers or interested staff. Nearly 10,000 complimentary tickets were distributed, principally by mail. These required that the name, address, and field of interest of the user be filled in. Those presented and, therefore, the number who actually saw the Exposition totaled 3,690.

Their fields of interest follow:

General interest (includes wives and students)	1,304
Engineering and Technology	518
Physics (all fields)	492
Chemistry	373
Medicine	351
Science Teaching	176
Biology	156
Geology	92
Social Sciences	68
Astronomy	58
Psychology	38
Mathematics	36
History of Science	20
Anthropology	8
Total	3,690

**Registration.** Paid registrations, absolutely necessary to support the meeting, were analyzed in the preceding discussion of the attendance. It is believed that a large majority of those who attended the technical sessions of the participating societies paid the relatively low registration fee of \$2.00 for members of the AAAS, for spouses of registrants, and for bona fide students. All others paid \$3.00.

In return for his registration fee, each registrant received the 304-page General Program and a name badge, had his registration card posted in the Visible Directory of Registrants, was eligible for repeated admissions to the Annual Science Exposition and the Science Theatre, enjoyed refreshments at the Biologists' Smoker, and, finally, had the satisfaction of being a sustaining part of the Meeting.

**Advance registration.** Of the registrants, 831, or 35 per cent, were advance registrants who paid a premium of twenty-five cents to receive the General Program by first-class mail, well in advance of the meeting. Though the extra charge covered only part of the postage (39 cents plus 3 cents for badge plus handling), the Association strongly believes in advance registration, which has the advantages of being more convenient in the avoidance of congested registration desks and of providing the opportunity for unhurried and complete consultation of the Program beforehand. The Association, too, is spared some of the heavy clerical work at the meeting.

**Visible Directory of Registrants.** The Visible Directory of Registrants—a series of Kardex files, long familiar to those who have attended AAAS meetings in the past—occupied the entire stage of the Cleveland Public Auditorium. This year it was 50 per cent enlarged and subdivided by syllables. Thus, not only were the cards of the advance registrants in perfect order, but it was possible to file the names of the other registrants almost as completely. The Directory could be consulted as late as 11:00 P.M. and also when the Exposition was closed.

**Housing.** The experienced Housing Bureau of the Cleveland Convention and Visitors' Bureau, headed by Louise D. Perkins, handled housing reservations most capably. In general, the hotels were prompt in their confirmations and careful of their bookkeeping; exactly 1,600 people were placed; as always, there were others who made their own arrangements. A total of three complaints about charging above advertised rates came to the attention of this office; they were adjusted to the delegates' satisfaction.

**Press Service.** As in past years the Press Service was under the efficient direction of Sidney S. Negus. One hundred and sixty-six reporters covered the meeting either directly from the Association's Press Room at Hotel Statler or by means of abstracts or papers and/or complete manuscripts mailed before and during the convention. Thanks to the splendid cooperation of authors of papers and of section and society secretaries with the Association's Press Service, daily news stories appeared in all the principal newspapers of the country and in many abroad. Feature stories, not requiring close deadlines, have been published since the convention and will continue to appear for some time. Marilyn D. Eggers, in charge of radio and television, arranged 25 programs out of Cleveland—a record performance. David Dietz and members of his local committee on publicity helped greatly in making working conditions ideal for representatives of the press, radio, and television. The Association is deeply appreciative of the outstanding coverage of its annual meetings by members of the National Association of Science Writers and other representatives of the Fourth Estate.

**Tours.** Eleven tours to about twice as many academic and industrial laboratories and institutions were planned. Partly because of the inclement weather, but principally because the programs held the attention of those in attendance, there were no organized tours. There were, however, individuals who took advantage of the opportunity to visit these points of interest. They and the Association appreciate greatly the courtesies that were extended.

**AAAS Presidential Address and Reception.** By tradition, the Presidential Address of the American Association for the Advancement of Science is given by the Retiring President. It is the last important act that terminates his three years of service. On the evening of Thursday, December 28, in the Ballroom of the Hotel

Statler, Elvin C. Stakman, ninety-ninth president of the AAAS, delivered an address on "Science and Human Affairs" that will never be forgotten by the capacity audience that was present. Their attention was complete, and the hearty and sustained applause at the end constituted an ovation to an exceptional personality.

**The Academy Conference.** The Academy Conference is made up of officers and other interested members of the 38 state and city academies of science affiliated with the Association. The conference has long provided a common meeting ground for academy officers to discuss problems of mutual concern. In recent years the conference has expanded to include one or more sessions, a business meeting, a dinner, and an evening address. At the 117th Meeting, the Academy Conference inaugurated several constructive features. The exhibition of publications of the state academies in the Science Library; the preparation and distribution, at the conference, of special reports from the several academies; and the reorganization of the Academy Conference that makes provision for the Executive Committee, with a retiring president and president-elect, to give it continuity—all testify to the energy and vision of Boyd Harshbarger, president during 1950. On the morning of Saturday, December 30, Arthur Bevan spoke on the growth of the academies of science, and Boyd Harshbarger, in his presidential address, outlined "The Organization of the Academy Conference." The afternoon program, which had been arranged by Dael Wolfe, was a panel on the "Effect of Government Support of Scientific Research." Those who spoke were Eric A. Walker, L. R. Hafstad, and Detlev W. Bronk. The evening address by Professor H. J. Fuller has already been mentioned.

**Biologists' Smoker.** A meeting of the AAAS would be incomplete without a Biologists' Smoker, where everyone attending the meetings has an opportunity to see old friends and cultivate new ones. At the 117th Meeting, the smoker was cosponsored by the American Society of Zoologists and the Association. It was scheduled from 9:30 P.M. till midnight Friday, December 29, to avoid conflict with the dinners of the zoologists and science teachers, and the addresses of the Scientific Research Society of America and the United Chapters of the Phi Beta Kappa. It was held in the Main Exhibition Hall, under the arena, of the Public Auditorium, the only place in downtown Cleveland that would accommodate the nearly 2,500 who attended. Cigarettes, presented with the compliments of Philip Morris & Co., Ltd., Inc., and refreshments were all available in ample quantities. Carling's Ale and Coca Cola were generously donated by the Brewing Corporation of America and the Cleveland Coca-Cola Bottling Company, respectively. Four kinds of crackers and pretzels were the gift of the National Biscuit Company. On behalf of those who attended and enjoyed this hospitality, the American Association for the Advancement of Science expresses its grateful appreciation.

**The Science Theatre.** The AAAS Science Theatre, with its showing of the latest domestic and foreign scientific films, has become a permanent feature of the annual meeting. As in 1949, nearly 70 different films, illustrating a variety of subject fields, were arranged in 6 different four-hour programs. All programs but one were completely repeated. A majority of these 16-mm films, with sound, were shown on a special screen in the Little Theatre of the Auditorium. The running time of individual films ranged from 6 to 55 minutes but, by following the program, it was possible to plan to see a particular film.



**Annual Science Exposition.** The 1950 AAAS Annual Science Exposition literally filled the entire arena of the Cleveland Public Auditorium. With 105 exhibitors in 155 booths, it was the largest and most diversified exposition the 102-year-old Association has ever held. The leading publishers, instrument makers, manufacturers of microscopes, and others who have long furnished teaching scientists with their essential supplies this year were joined by an impressive group of industrial concerns—a number of them from Cleveland and northern Ohio.

The technical exhibits of this last group gave the scientists and other professional persons who attended an appreciation of some of their newest technological accomplishments. Notable among exhibits by institutions was the four-part display of the American Museum of Atomic Energy. The entire Annual Science Exposition was on a

scale impossible of attainment at any meeting of an individual society or group of societies in one field. Those who saw the Exposition—more than six thousand—were impressed not only by the exhibits and by their contacts with those in charge, but also by the atmosphere of dignity, attractiveness, and professional excellence.

It is gratifying that, by mid-January, so many of the exhibitors at Cleveland already have asked for space in the 1951 Exposition of Science and Industry in Philadelphia.<sup>a</sup> A list of the exhibitors at the Cleveland Meeting and a description of their exhibits appeared in *SCIENCE*, December 8, 1950.

<sup>a</sup> Exhibitors at Cleveland who reach a decision and who advise the writer by March 1 that they will participate at Philadelphia have preferred status for location and 10 per cent discount on booth rentals.

## Association Business

Howard A. Meyerhoff

*Administrative Secretary*

**T**HE General Officers of the Association for 1951, all of whom are elected by the Council, were announced in the January 5, 1951, issue of *SCIENCE* (p. 3, advertising section).

### *The Administrative Officers*

**Administrative Secretary:** Howard A. Meyerhoff, 1515 Massachusetts Ave., N.W., Washington 5, D. C.

**Assistant Administrative Secretary:** Raymond L. Taylor, 1515 Massachusetts Ave., N.W., Washington 5, D. C.

**Treasurer:** William E. Wrather, U. S. Geological Survey, Washington, D. C.

### *Secretaries of Sections:*

**Mathematics (A):** Raymond W. Brink, University of Minnesota, Minneapolis, Minnesota.

**Physics (B):** F. S. Brackett, National Institutes of Health, Bethesda, Maryland.

**Chemistry (C):** Edward F. Degering, 939 West Sunnyside, Chicago 40, Ill.

**Astronomy (D):** Frank K. Edmondson, Indiana University, Bloomington, Indiana.

**Geology and Geography (E):** Leland Horberg, University of Chicago, Chicago, Illinois.

**Zoological Sciences (F):** J. H. Bodine, University of Iowa, Iowa City, Iowa.

**Botanical Sciences (G):** Stanley A. Cain, University of Michigan, Ann Arbor, Michigan.

**Anthropology (H):** Marian W. Smith, Columbia University, New York, New York.

**Psychology (I):** Delos D. Wickens, Ohio State University, Columbus, Ohio.

**Social and Economic Sciences (K):** Philip M. Hauser, University of Chicago, Chicago, Illinois.

**History and Philosophy of Science (L):** Raymond J. Seeger, Bureau of Ordnance, Navy Department, Washington, D. C.

**Engineering (M):** Frank D. Carvin, Illinois Institute of Technology, Chicago, Illinois.

### *Medical Sciences (N):*

**Subsection on Medicine (Nm):** Gordon K. Moe, University of Syracuse, Syracuse, New York.

**Subsection on Dentistry (Nd):** Russell W. Bunting, University of Michigan, Ann Arbor, Michigan.

**Subsection on Pharmacy (Np):** Glenn L. Jenkins, Purdue University, Lafayette, Indiana.

**Agriculture (O):** C. E. Millar, Michigan State College, East Lansing, Michigan.

**Education (Q):** Dean A. Worcester, University of Nebraska, Lincoln, Nebraska.

### *Officers of the Pacific Division*

**President:** Charles H. Danforth, Stanford University, California.

**Secretary:** R. C. Miller, California Academy of Sciences, Golden Gate Park, San Francisco, California.

### *Officers of the Southwestern Division*

**President:** C. W. Botkin, New Mexico A & M College, State College, New Mexico.

**Secretary:** Frank E. E. Germann, University of Colorado, Boulder, Colorado.

## AAAS Council

At the meetings of the Council held in Cleveland on December 27 and 29, in addition to the election of officers, the following business was transacted:

1. Kirtley F. Mather reported for the Committee on the Revision of the Constitution and Bylaws. Following exposition of the need for a new set of bylaws, and the committee's conclusion that there should be simultaneous revision of the constitution, Dr. Mather asked that the Council indicate by vote whether the committee may proceed with the revisions outlined. These revisions call for clearer definitions of the functions of the Council, the Executive Committee (to be renamed the Board of Directors), and the administrative staff. The Council voted to have the Committee proceed along the lines indicated.

Dr. Mather presented for discussion a suggestion for reconstituting, and reducing the size of the Council. The discussion indicated that those present do not consider the size of the Council (approximately 270 members) a serious handicap, and favor preserving the principle of individual society representation.

As the sequel to a discussion as to how Council members may acquaint themselves with Association business, it was moved, seconded, and voted that the Council be kept informed of all important actions taken by the Executive Committee.

2. The following reports were presented:

- a) Executive Committee, E. C. Stakman, chairman
- b) Administrative Secretary
- c) Publications Committee, Fernandus Payne, chairman
- d) Editorial Board, Howard Meyerhoff, chairman
- e) Committee on Affiliation and Association, M. H. Soule, chairman
- f) Cooperative Committee, Morris Meister, chairman
- g) Building Committee, Roger Adams, chairman

3. Dr. Adams' report on plans for a new building was discussed at length, and the plans prepared by Walter Gropius' students were examined and criticized. In response to the chairman's queries, it was indicated that members of the Council favor

- a) a building of the "slab" type, such as Plan C or Plan A in the Gropius group;
- b) an auditorium, preferably detached, with seating capacity of 300;
- c) postponement of construction of the auditorium, if funds are not initially adequate to cover full costs of main building, essential equipment, and auditorium.

4. A letter from Robert C. Miller, secretary of the Pacific Division, was presented, asking the Council to approve in principle a proposed constitutional amendment, whereby the Division may have a president-elect, a president, and a retiring president who will serve as chairman of the Division's Executive Committee. On the understanding that the amendment, if adopted at the annual meeting of the Division in June 1951, will be presented to the Council for ratification, it was moved, seconded, and voted that the proposed amendment be approved in principle.

5. Two designs of lapel buttons were examined by members of the Council, and the Administrative Secretary was authorized to arrange for the manufacture and distribu-

tion of the design favored by the majority of those present.

6. Dr. Adams discussed the current situation relative to scientific manpower, summarizing the specific activities, actions, and interests of the Association in the many and varied questions that are arising. It was moved, seconded, and unanimously voted to adopt a resolution passed by the Executive Committee, namely,

- a) The American Association for the Advancement of Science affirms with all seriousness and conviction that it would be a national calamity not to make a maximum use in the present emergency of the scientific and technical skills possessed by our trained personnel; and that it would be equally calamitous not to assure an adequate continuing supply of such trained personnel;
- b) To achieve these objectives of making a maximum use and assuring an adequate continuing supply of trained personnel, a system of Universal National Service, as distinct from Universal Military Service, should be instituted, to be administered by a carefully qualified civilian agency that will grant no deferments but will allocate all scientific and technical personnel to such national service as their individual training and skills permit, and national needs require.
- c) It was further voted that, in view of the importance of the principles involved and in view of the limited attendance at the Cleveland meeting, the two preceding motions be referred by mail to the entire Council for an expression of views and for a final vote.

# AAAS Membership

## 1. Changes during 1950

New members .....		6,283
Deaths .....	394	
Resignations .....	1,666	
Automatic resignations .....	2,395	
Total outgoing .....		4,455
Net increase during 1950 .....		1,828

## 2. Totals as of 31 December 1950

Paid for 1950 .....	33,187
Paid through June 1951 .....	8,014
Life members, etc. ....	573
In good standing .....	41,774
In arrears .....	2,673
	44,447
New for 1951 .....	2,328
Total membership .....	46,775



## Reports of Sections and Societies<sup>1</sup>

### Section on Mathematics (A)

Section A conducted a symposium on Mathematics in Applied Science in two sessions on the morning and afternoon of Saturday, December 30. The following papers were presented and excited a good deal of discussion: "Operations Research and Mathematicians," by Philip M. Morse, Massachusetts Institute of Technology; "Finite Difference Methods in the Theory of Structures," by Oscar Hoffman, Case Institute of Technology; "Deformations and Stresses in Bourdon Tubes," by Robert A. Clark, Case Institute of Technology; "Numerical Solution for Nonlinear Elliptic Partial Differential Equations," by L. Richard Turner, NACA Lewis Flight Propulsion Laboratory; "Noncalculational Mathematics in Engineering," by Brockway McMillan, Bell Telephone Laboratories; "On the Use of Mappings in Designing Cascades for Compressible Flows," by George R. Costello, NACA Lewis Flight Propulsion Laboratory; and "Theory of Geodesics Applied to Electromagnetic Propagation Between Curved Plates," by Kaiser Kunz, Case Institute of Technology. The sessions were attended by 40 persons. Robert F. Rinehart and Sidney W. McCuskey presided at the morning and afternoon meetings, respectively.

Section A also cosponsored the Symposium on Mathematical Biology and Biometry of the Biometric Society, Eastern North American Region. Several of these sessions had a high degree of mathematical content.

R. W. BRINK, *Secretary*

### Section on Physics (B)

For the past two years Section B has been exploring the possibilities as to the kind of program best suited to physics at the annual meetings. The idea of a group of invited symposia, one strictly in the field of physics and others in borderline or related scientific fields, seems to be a happy solution, encouraging the interest of research people in related sciences and not duplicating the content or purpose of the meetings of the American Physical Society and its affiliates.

This year two of the symposia on borderline subjects were arranged through the generous efforts of cooperating sections in the other sciences. Despite the modest attendance at the Cleveland meetings, the section symposia were well attended. One gains the general impression that there is considerable enthusiasm about such symposia among those who have attended them. The fact is, however, that very few physicists have been on hand for these meetings either year. One reason, of course, is that the programs have not been prepared sufficiently far in advance to receive adequate publicity. Physicists are not in the habit of attending the AAAS meetings and consequently are not aware of the nature of these programs. We feel sure that, had more physicists attended, they would have found the addresses of great interest and their time well spent.

Because of the short time and the necessity of completing the programs by telephone, the secretary made a serious error in regard to the Geophysics Symposium in that only a preliminary plan appeared in the announcements. The secretary particularly wants to call attention

<sup>1</sup> Key symbols correspond to those in the General Program.

to the content of this program and to express his deep appreciation to Dr. Merritt and his committee for arranging a session that received so much enthusiastic mention by those in attendance. It included: "The Origin of the Earth," by Harold Urey; "Radioactivity and the Origin of Continents," by P. M. Hurley; and "Metallogenesis in the Light of Radioactive Investigations," by G. W. Bain. I am sure that, if more people had been aware of the nature of the program, our hall would have been far from adequate.

An excellent symposium was also arranged in the field of astrophysics by Dr. Edmondson. This program, taken in conjunction with the subject matter of the geophysics program and the excellent review of "Fifty Years of Quantum Theory," by Drs. Darrow and Condon, gave a beautiful picture of the present concepts concerning stars and our earth and moon.

For next year the idea has been suggested that there be just two symposia and a dinner meeting all on the same day. It is thought that this plan would attract physicists from some distance and encourage a discussion at the dinner meeting concerning the purpose and content of Section B programs.

FREDERICK S. BRACKETT, *Secretary*

### Oak Ridge Institute of Nuclear Studies (B2)

#### Oak Ridge National Laboratory (B3)

The one-day program on atomic energy given at the Cleveland meeting was the first to be sponsored by the Oak Ridge Institute of Nuclear Studies as an associated society of the AAAS. The institute joined with the Oak Ridge National Laboratory in presenting it. It is hoped that a second can be sponsored at the 1951 meeting on the medical aspects of atomic energy.

The program was held on December 28 in the Cleveland Public Auditorium. About 150 persons attended in the morning, and approximately 350 in the afternoon.

The morning session consisted of three talks on various aspects of atomic energy. Eugene P. Wigner opened the program by pointing out that the atomic energy project has reversed the usual order in that a technology has made significant contributions to the sciences. In discussing the impact of atomic energy on the sciences, he reported that the contributions traceable to it are characterized not so much by their spectacular nature as by their great variety and the number of sciences they cover. The most profound effects are in the provision of new research tools—notably radioisotopes—the enrichment of the field of nuclear physics itself, the stimulation of interest and the raising of problems in related fields, and the changes brought about in the thinking of scientists on fundamental questions of science.

Henry D. Smyth next discussed the critical situation in which this country finds itself and then outlined the means through which he felt scientific manpower could best be mobilized. This is through the creation of a Scientific Service Corps under a Scientific Manpower Board responsible to the President, and the establishment of a Student Scientific Corps to provide for the training of new scientists during the 20-year period of international tension and crisis that he foresees.

While stressing the interrelationship of the sciences, John A. Swartout, Assistant Research Director, Oak

Ridge National Laboratory, outlined in detail the contributions of the chemist to the atomic energy program. At the beginning of the atomic energy project, uranium and plutonium were among the least known of the elements; today they are among the most thoroughly known chemically. In a single sentence he summed up the great task of the chemists in 1942: "... the problem was, in brief, the separation of an element which had never been seen and whose chemistry was practically unknown from a manyfold greater amount of uranium, whose chemistry was also incompletely known, and from the elements produced by the fission of uranium, the identity and number of which were but partially known." After describing the striking manner in which these problems were solved, he went on to identify a new group of problems that now face the chemist in the successful design of efficient reactors for power purposes—namely, radiation chemistry, "hot-atom" chemistry, and high-temperature chemistry.

The afternoon program consisted of a seminar on "Ten Years of Atomic Energy—A Review of Progress." Walter H. Zinn reviewed the history of reactors to the present time and outlined the problems involved in their future development. Miles C. Leverett handled the role of military developments, C. G. Suits sketched the possibilities of power production, and Philip Sporn discussed the means through which private industry could best participate in the atomic energy program. Alvin M. Weinberg served as moderator.

Mr. Sporn pointed out that industrial participation is slight at this time, largely because of striking advances made in the generation of electric power by conventional means. The newest steam plants have a conversion ratio of 38 per cent thermal efficiency compared to 13–15 per cent a few years ago. He noted also that atomic energy is a new fuel instead of a new kind of power. Dr. Suits pointed out that, in the conversion of atomic energy to power, we are "paying a high price for the elementary state of our knowledge of reactor technology." He developed the interesting approach to the economic aspects of atomic power by computing the capital investment in a power reactor which could be made under various operation assumptions, if power is to be produced at the same cost per KWH as is available from a conventional steam plant with an investment in the boiler component of \$18,400,000. Over the range of his assumptions the same power output could be obtained at the same cost with a nuclear boiler plant capital investment as high as \$65,000,000 in the most favorable case.

Dr. Leverett pointed out that the military is furnishing almost the entire motivation for the atomic energy program at this time and noted that this had frequently been the case with many technical developments in the past. An analogy was drawn in this respect to the Diesel engine, for which the very large initial development costs were born by the Navy in its search for a satisfactory submarine power plant.

The Oak Ridge Institute of Nuclear Studies also provided several exhibits from the American Museum of Atomic Energy for the Science Exposition which was an integral part of the AAAS meeting.

WILLIAM G. POLLARD, *Secretary and Executive Director*  
Oak Ridge Institute of Nuclear Studies

### Section on Chemistry (C)

Papers at the general chemistry session covered such topics as "Seven Echoes from History," "Free Radical Aromatic Substitution," "The Structure of Heparins,"

"The Chemist Helps the Dentist," "National Cooperative Undergraduate Chemical Research," "Some Reactions of Ketene and Diketene," "Quantitative Studies on Urinary Thiosulfate Excretion by Human Beings," and "Human Health in Relation to Inorganic Bioelements."

The papers presented at the AAAS steroid symposium, arranged by Hal G. Johnson, of Monsanto Chemical Company, reviewed the whole picture of hormones, not only from a clinical and pharmacological point of view, but also from a chemical viewpoint. Dr. Kirk reviewed the steroid hormones and present knowledge as it relates to aging, and the new science of gerontology. Dr. Tishler summarized the progress made with cortisone but also disclosed that Merck is now in a position to synthesize adequate quantities of Compound F for more thorough evaluation in the field. In the discussion, it was emphasized that, although Compound F may be more difficult and costly to make, it may well be used in the future with Compound E in the treatment of arthritis.

Dr. Dobriner, of the Sloan-Kettering Institute for Cancer Research, summarized the data on the metabolism of the adrenocortical hormones. His paper indicated that there is a difference in metabolism associated with cancerous and noncancerous patients. The significance of these findings is speculative, but it certainly emphasizes the relationship of hormone metabolism and cancer.

The papers by Drs. Wagner and Heymann related to the chemistry of the steroids, Dr. Wagner's dealing with steroidal apogenins, and Dr. Heymann's with a new route to 11' ketosteroids. Dr. Heymann particularly emphasized some new chemical reactions and findings on the intermediates of Compound E. In Dr. Jacobson's paper, the value of adrenal glands in the preparation of corticosterone by perfusion with blood and saline solutions was emphasized as a technique for preparing the necessary chemical intermediates. The discussions were stimulating, as the questions raised were speculative or referred to research work not yet completed.

The program on agricultural chemicals, arranged by Hal G. Johnson and covering the various phases of the work normally associated with preparing, testing, and approving chemicals for use in agriculture, was well balanced. The function of the plant pathologist in field-testing, and the position of the chemist in synthesizing and evaluating chemicals for insecticidal, fungicidal, and herbicidal use, were related by the various speakers.

Mr. Long ably outlined the history of chemical developments in the past 10 years, as a layman and editor sees them. In the discussion the necessity for education of the public and of government to appreciate the problems associated with development of new chemicals for agriculture was stressed. Dr. Wilson emphasized the difficulties associated with the evaluation of new chemicals in field-testing, where it is important to have uniform techniques for such evaluations and, even more important, where the value of equipment is a factor. The mechanical engineering features of utilizing agricultural chemicals were discussed by several of the speakers.

Dr. Tisdale reviewed from a research and development point of view the problems associated with the synthesis and testing of insecticides and fungicides. Dr. Sherwood outlined what has been done with herbicides and what the potentials are in terms of increasing the yield of desired crops by proper use of herbicides. The successful use on sugar cane and pineapple crops was reviewed, and the potential use on grains, especially corn, was emphasized. In the future, chemicals will perhaps be as im-



portant as mechanization has been in the past 30 years.

Mr. Leaper and Dr. McNew reviewed the chemical aspects of different chemicals as related to herbicides and fungicides. Both papers pointed out the value of the chemist in synthesizing new chemicals for agricultural use. The specific problems associated with fruit diseases were reviewed by Mr. Dunegan, and the history and development of parathion were given by Mr. Horsfall. The latter paper stressed the caution and care that industry uses in developing and evaluating new chemicals for the industry.

The symposium on "Recent Advances in the Chemistry of the Antibiotics and Vitamins," arranged by Stanton A. Harris, of Merck & Co., Inc., and H. E. Canter, of the University of Illinois, included papers by:

J. R. Schenck, of Abbott Laboratories, who reported on the isolation and characterization of a new antibiotic—hydroxystreptomycin. The location of the hydroxyl group was determined by degradation studies, which yielded streptidine and N-methyl-L-glucosamine but not maltol. These results, together with the absence of a C-methyl group, establish that the new antibiotic is streptomycin substituted with a hydroxyl group on the methyl group of the streptose portion.

M. L. Wolfson, of Ohio State University, who gave an excellent review of the stereochemistry of streptomycin, elucidating the configuration of the glycosidic linkages of N-methyl-L-glucosamine to streptose and of streptose to streptidine.

R. L. Peck, of Merck & Co., who described the isolation of crude neomycin and the separation from such material of one of the antibacterial components—neomycin A—in a pure state. Neomycin A is not the major component of crude neomycin.

G. E. Boxer, who described the work leading to a chemical assay method for vitamin B<sub>12</sub>. The method depends on the liberation by vitamin B<sub>12</sub> of one mole of cyanide, a reaction which is markedly accelerated by light. The cyanide is then determined by a millimicro method that is sufficiently sensitive to allow the determination of vitamin B<sub>12</sub> in urine and tissues.

The 117th meeting of the American Association for the Advancement of Science marked the first time that a symposium devoted exclusively to forensic science was presented before the members of the Association. Ralph F. Turner, of the Department of Police Administration, Michigan State College, arranged a panel that included notable authorities from the fields of pathology, toxicology, petrography, and ballistics. The purpose of the panel was to acquaint fellow-scientists with the application of various scientific disciplines to the problems of the administration of justice. Forensic science has enjoyed tremendous advancements during the past decade, and it was felt that the contributions of the workers in this field should be presented before the AAAS in an effort to clarify their position and to point the way for more careful consideration of this segment of applied science. Topics discussed were: "The Electrical Resistance of the Human Body," by A. R. Moritz, of Western Reserve University; "Medico-Legal Investigation of Partially Burned Bodies," by Frank Dutra, of the University of Cincinnati; "Chemistry and Spectroscopy of the Toxic Metals," by Charles Umberger, of the Office of Chief Medical Examiner of New York City; "Petrographic Aspects of Scientific Crime Detection," by Ray Jevons, of the FBI; and "The Identification of Guns Used in the Commission of Crime," by J. H. Mathews, of the University of Wisconsin.

A symposium on Advances in Inorganic Chemistry, arranged by W. Conrad Fernelius, of Pennsylvania State College, included papers on "The Newer Refractories," by L. S. Foster, of the Ordnance Department; "The Metallurgy of the Less Familiar Elements," by B. W. Gosser, of Battelle Memorial Institute; "The Chemistry of Hafnium and Zirconium," by E. M. Larsen, of the University of Wisconsin; "Recent Developments in the Field of the Rare Earths," by L. L. Quill, of Michigan State College; "The Use of Magnetic Susceptibility Measurements in Inorganic Chemistry," by P. W. Selwood, of Northwestern University; "The Importance of Trace Elements in Chemistry," by R. Ward, of the University of Connecticut; "The Fundamental Chemistry of Glass," by W. A. Weyl, of Pennsylvania State College; and "Recent Developments in the Field of Coordination Compounds," by W. C. Fernelius and B. E. Douglas, of Pennsylvania State College.

ED. F. DEGERING, *Secretary*

### Section on Astronomy (D)

The Section D program consisted of (1) a joint symposium with Section B, (2) two vice-presidential addresses, and (3) ten contributed papers dealing primarily with problems in astrometry and astrophysics.

The symposium dealt with Fifty Years of Quantum Theory in Astrophysics and covered the data on spectra now available to the astrophysicist, applications to stellar spectra, and a discussion of nuclear processes in stellar interiors. The speakers were Charlotte Moore Sitterly (National Bureau of Standards), Guido Münch (University of Chicago), and Geoffrey Keller (Ohio State University and Ohio Wesleyan University).

Edwin F. Carpenter (University of Arizona) was chairman of Section D in 1942, and wartime conditions prevented him from giving his address on schedule. His address, "Associations of Galaxies," presented some very interesting and important conclusions, based largely on photographs taken by him at the Steward Observatory in Tucson.

This year's retiring chairman, Alfred H. Joy (Mount Wilson and Palomar Observatories), gave a very interesting popular lecture on "Stellar Explorations with the Spectrograph."

FRANK K. EDMONDSON, *Secretary*

### Section on Geology and Geography (E)

The sessions of Section E were held at the Cleveland Public Auditorium and Hotel Carter, Cleveland, December 27-29. Approximately 150 persons participated, with an average attendance of about 50 at each session. The program included: General Geology, two sessions, 15 papers; Geography, two sessions, 11 papers; Program for Nonprofessionals, two sessions, 10 papers; Soils Symposium with Section O (Agriculture), three sessions, 14 papers; Atomic Energy Program with Section B (Physics), one session, 3 papers; Geography field trip; Section E smoker; and the vice-presidential address by Raymond C. Moore. The General Geology program was organized by Henry F. Doner, the Geography program by Benjamin Moulton, the Program for nonprofessionals by Charles S. Bacon, Jr., and the Soils Symposium by C. E. Millar, Secretary, Section O. Two innovations in the program are noteworthy: the Program for Nonprofessionals, which was intended to bring interested laymen and high-school teachers into contact with professional geological activities, and the Soils Symposium, which



brought together workers in the closely allied fields of soils genesis and Pleistocene geology. A special printed program, including abstracts of papers, was made available through the cooperation of The Geological Society of America.

The regular Section elections and Council actions resulted in the election of the following: *vice president and chairman*, George W. White; *retiring vice-president*, Kenneth K. Landes; *elected section committee*, Norman Newell.

LELAND HORBERG, *Secretary*

## National Geographic Society (E2)

Despite iced-over pavements and  $-2^{\circ}$  weather, 1,800 members of the AAAS and guests attended the color-illustrated lecture of Dr. and Mrs. Matthew W. Stirling Wednesday evening, Dec. 27, in the Music Hall of the Cleveland Public Auditorium. The Stirlings, an archaeological team, have headed eleven expeditions to southern Mexico and Central American countries to study pre-Columbian civilizations in this hemisphere, under the joint sponsorship of the National Geographic Society and the Smithsonian Institution. They described their recent expedition to Panama where, for the first time, helicopters were used in archaeological exploration.

Kirtley F. Mather, president of the AAAS, presided and introduced the lecturers. Dr. Stirling, who is director of the Bureau of American Ethnology, Smithsonian Institution, and Mrs. Stirling, left Washington January 2 to return to Panama for further research.

LEONARD C. ROY, *Chief of School Service*

## National Speleological Society (E3)

The National Speleological Society is one of the youngest member groups of the AAAS, and the meeting of the Association at Cleveland was the first opportunity the society has had to participate in an annual convention. As described in the General Program:

The National Speleological Society was founded in 1939, and operates as a nonprofit scientific-educational organization, under a District of Columbia Charter. The Society serves as a central agency for the investigation, collection, compilation, preservation, and publication of scientific, historical, and legendary information relating to caves and limestone areas. It arouses interest in the discovery of new caves, promotes the exploration, mapping, photographing, and study of caves in their geological, mineralogical, hydrological, and biological aspects. It seeks to protect caves and their contents against vandalism, pollution, and unwise exploitation. Total membership, 1050.

Two sessions were held on Thursday, December 28. The attendance at these sessions was about equally divided between members of the society and visitors and friends who had an interest in speleology. A great variety of subjects was covered, and the interest evidenced in, and questions asked about, the papers promoted considerable discussion after the presentation of each one.

James A. Fowler, of the Philadelphia Academy of Natural Sciences, reported on an unusual aggregation of the salamander *Plethodon dixi* as discovered, observed, and studied in Dixie Caverns, Salem, Va. Individuals of this newly described salamander are most abundant during the summer months and scarce during the winter and early spring. These findings contrast with those of Charles E. Mohr, president of the National Speleological Society and director, Audubon Nature Center, Greenwich,

Conn., who discussed "A Remarkable Migration of Cave Salamanders." The studies reported by Mohr were conducted in an abandoned mine near Valley Forge, Pa., and showed that the salamanders left the mine during the summer months and in the early fall returned to cover and may be observed in large numbers during the winter.

Joe Morrison, of the National Museum of Natural History, discussed the "Zoogeography of the Cave Snails of Eastern North America." Nancy Rogers, of the Army Medical Service Research and Graduate School, presented some preliminary "Notes on the Habits of the Lump-nosed or Long-eared Bat." Burton Faust, executive vice president of the National Speleological Society, discussed "The Subterranean Accumulation of Salt-Petre," ascribing it to the activities of nonsymbiotic nitrogen-fixing bacteria. G. Alexander Robertson, engineer with the City of Richmond, Va., and chairman of the Photographic Committee of the National Speleological Society, discussed some of the ways in which photography can be of inestimable assistance in the study of speleology. Paul Price, geologist for the State of West Virginia explained how "A State Geologist Looks at Speleology." The study of caves includes stratigraphy, geomorphology, mineralogy, hydrology, and paleontology, all of which must be considered if the state geologist is going to render the people of his state the fullest service.

William Foster, chairman of the Mineralogical and Formations Committee, described and explained the erratic development of helactites, anthodites, nodular outgrowths, etc. William E. Davies, of the U. S. Geological Survey, discussed the "Erosion Levels in the Potomac Drainage System and their Relation to Cavern Development." The recent study of terraces and caverns indicates a close relation between erosion levels and cavern levels in folded limestone areas.

Charles E. Mohr in his presidential address discussed the "Research Possibilities in Speleology." Workers in all fields of sciences from archaeology to zoology have the opportunity to work in substantially a virgin field. The early history of man, evolution, prehistoric life, ground water movement, mammalogy, mycology, and paleontology lie in the several provinces of speleology.

Condensed from a report by BURTON FAUST,  
*Executive Vice President*

## Section on the Zoological Sciences (F)

Despite lower general registration, meetings sponsored by Section F were well attended. At the business meeting attention was directed to the large number of individuals enrolled in the section—more than 4,000—and the desirability of making the section function as originally constituted—i.e., the interpretation of the zoological sciences and the coordination of activities among all zoological and other biological societies. The question of the advancement and election of members as Fellows of the AAAS was raised, and plans were suggested to bring the list up to date.

The following lectures, symposia, and other sessions were sponsored by Section F:

Business meeting

Symposia:

Implications of Nuclear Phenomena—Section B (Physics)

Radiobiology—Sections F, Nm

Genetics and Behavior—Sections F, I (Psychology)

Zoologists' Dinner

Vice-presidential address

Biologists' Smoker

The programs presented were most interesting and stimulating. The Biologists' Smoker was especially good not only because of the prearranged plans but also because the room facilities in the Cleveland Public Auditorium were practically ideal.

J. H. BODINE, *Secretary*

### American Society of Parasitologists (F1)

The society's technical programs occupied three crowded days, in the course of which more than 120 papers were presented or read by title. Special features included a commemoration of the society's 25th anniversary, and W. H. Wright's presidential address on "Medical Parasitology in a Changing World." At the annual business meeting of the society it was voted to meet in Chicago, November 15-17, with the American Society of Tropical Medicine, the American Academy of Tropical Medicine, and the National Malaria Society. The following officers were elected: *president*, Benjamin Schwartz, Zoological Division, U. S. Bureau of Animal Industry, Washington, D. C.; *vice president*, Eloise B. Cram, Laboratory of Tropical Diseases, National Institutes of Health, Bethesda, Md.; *treasurer*, Robert M. Stabler, Colorado College, Colorado Springs.

H. W. BROWN, *Secretary*

### American Society of Protozoologists (F2)

The American Society of Protozoologists held its first annual meeting with a program of members' papers on December 27 and 28. Of the 34 papers whose titles and abstracts appeared in the printed program, 27 were presented in person and 7 by title. Free-living protozoa were the subject of 20 of the papers, parasitic protozoa of 14. A major present-day trend in protozoologist research was indicated by the fact that the scope of 15 of the papers was concerned with some aspect of cellular physiology, 10 of these in turn with nutritional requirements or effect of antibiotics. Evidence that the contractile vacuole of a suction (Tokophrya infusionum) functioned during feeding to lower the internal pressure so as to draw the protoplasm of the prey through the predatory tentacles was presented by Maria A. Rudzinska and Robert Chambers. Notable in the field of morphology was Harold E. Finley's report on the finer details of thin sections of a ciliate, Spirostomum ambiguum, as revealed by the electron microscope.

D. H. Wenrich, the speaker at the annual luncheon on December 29, reported on matters of protozoological interest at the Fifth International Congress of Microbiology held at Rio de Janeiro. Sixty persons attended this luncheon, although 50 was the maximum at any of the other sessions. Forty-five new members were voted into the society. Plans for a journal were presented by S. H. Hutner.

R. P. Hall was reelected president for another year, Gordon H. Ball was elected vice president, and L. E. Noland to the vacancy on the Executive Committee. The Executive Committee voted to meet in Philadelphia in 1951 with the AAAS.

ELERY R. BECKER, *Secretary-Treasurer*

### American Society of Zoologists (F3)

The Society held its forty-seventh annual meeting in Cleveland, December 27-30, with the AAAS. The Hotel Hollenden served as headquarters, where most papers and symposia were presented. The papers, in general, were

good, and the symposia were excellent. About 400 zoologists attended the meeting, although the attendance was only two thirds as large as at New York City last year. The banquet at which Dr. Domm delivered his address on "Sex Differentiation: Genes or Hormones" was one of the high-lights of the meeting.

Officers elected to the Executive Committee for 1951 are: president, Douglas M. Whitaker, Stanford University; vice president, Lincoln V. Domm, The University of Chicago; treasurer, Harry A. Charipper, New York University.

The Executive Committee voted to hold the 1951 annual meeting of the Society in Philadelphia in December with the AAAS. It is expected that the annual meeting in 1952 will be held on the campus of Cornell University in September with the AIBS.

The proceedings of the Cleveland meeting, together with the revised list of members, will be published in the March issue of *The Anatomical Record*.

WALTER N. HESS, *Secretary*

### The Society of Systematic Zoology (F4)

The third annual meeting of the society was highlighted by the symposium and the use of the society's headquarters as a meeting place for zoologists. More than 100 zoologists attended the symposium, and at least 200 examined the books on display in the headquarters lounge.

The subject of the symposium was The Role of Systematics in Modern Zoology. The speakers were Alexander Petrunkevitch, of Yale; Waldo L. Schmitt, of the U. S. National Museum; and Lee R. Dice, of the University of Michigan.

At the meeting of the council an extensive and far-reaching program was adopted. A new journal of principles and problems of systematics, to be called "Systematic Zoology," was definitely planned for 1952. The exhibition of books of interest to zoologists in a central lounge at the annual meeting was thought valuable enough to be repeated annually and also extended to other meetings of zoologists throughout the year. The preparation of a book on the fundamentals of systematics was approved. Sessions for presentation of papers by members at the next annual meeting was planned; and active committee programs were initiated or continued to aid the *Zoological Record*, obtain preparation of useful handbooks, determine the members' views on various problems of nomenclature, prepare for the bicentennial of Linnaeus' 10th edition of the *Systema Naturae*, and so forth.

The 800th member was enrolled at Cleveland. It is confidently expected that 1,000 members will be enrolled by the time of the next annual meeting—which will be at Philadelphia, December 27-29, 1951.

R. E. BLACKWELDER, *Secretary-Treasurer*

### American Microscopical Society (FG1)

The sixty-seventh annual meeting of the society was held at Cleveland, in connection with the AAAS convention, December 27-29, 1950. The annual luncheon and business meeting of the Executive Committee convened Wednesday noon, December 27, in Parlor E of the Hotel Hollenden; President A. C. Chandler presided. Parlor E served as society headquarters throughout the meetings.

On Friday forenoon, a symposium of six excellent papers on *Modern Methods for Microscopy* opened at 9:00 A.M. in Parlor E but was so well attended that it became necessary to move to a larger room. Oscar W.

Richards, who had served during the past year as program chairman, presided at the meeting. Subjects presented by the six authors included polaroid ultraviolet color translation microscopy, reflecting microscopes in infrared spectrometry, biological polarization microscopy, refractive index of protoplasm, fluorescence microscopy, and interference, phase, television, and x-ray methods of microscopy.

The annual business meeting of the society, with the president presiding, opened at 4:00 P.M. Friday, December 29. Many details of society business were transacted. A new printer for the *Transactions*, Spahr & Glenn Company at Columbus, Ohio, was named. The following officers for 1951 were elected: *president*, David C. Chandler, Cornell University; *first vice president*, T. L. Jahn, University of California; *second vice president*, L. O. Nolf, University of Iowa; *elected member of executive committee*, O. W. Richards, American Optical Company. The first three of the new officers serve for one year each; elected members of the Executive Committee, for three years. Dr. Richards' term will be 1951-53. In addition to these officers, the treasurer, custodian, and secretary continue in office through 1951, as do also A. B. Dawson and R. V. Bangham. Elected Executive Committeemen, A. M. Chickering and F. E. Eggleton were reappointed as representatives of the society on the Council of the AAAS for 1951 and 1952.

The society voted to meet in 1951, either with the AIBS at Minneapolis in September or with the AAAS at Philadelphia in December, and instructed the Executive Committee to select between these two, after additional information becomes available.

F. E. EGGLETON, *Secretary*

## Biometric Society (FG2)

A marriage between two vast fields of knowledge—mathematics and biology—is the aim of scientists united in the Biometric Society, dedicated, according to its constitution to “the advancement of quantitative biological science through the development of quantitative theories and the application, development, and dissemination of effective mathematical and statistical techniques.”

In their session at the annual Christmas meeting jointly with Section A the members of the Biometric Society discussed agricultural experiments and biochemical problems, the propagation of nerve impulses and biological effects of radiation, decompression sickness in high-altitude flying, and the structure of animal societies. Since behavior can be seen both as a biological and as a social problem, the researches of mathematical biologists spill over into what is usually thought of as “social science.” There was one paper on the theory of mob behavior and another on how to tell something about the “latent characteristics” of individuals in a sample of population from the way they respond to specific situations or answer specific questions.

There are two different ways of applying mathematics to the study of life processes. One is to use statistical methods for designing experiments and for evaluating experimental data. That is the way of the biometricians proper. The other approach is that of the mathematical biologists, who follow the footsteps of the mathematical physicists. The mathematical biologists usually begin with a “model,” an idealized picture of some biological situation (such as a metabolizing cell, a growing population, an evolving nerve net, etc.). By means of mathematical analysis of the physical and chemical processes involved,

the biomathematicians deduce the behavior of the model. This leads to the construction of biological theories. The difference between an accumulation of “facts” and a science is somewhat like the difference between a pile of bricks and a house. On the other hand, the difference between “pure theory” and a science is like the difference between a blueprint and a house. For a full-fledged science, both the “blueprint” and the “bricks” are indispensable.

The following papers were presented in the sessions of December 27-29. Herman Branson, of Howard University, discussed metabolizing systems in the light of available data on the behavior of nucleic acids, iodine, etc., with a view of finding turnover times and other properties. J. Z. Hearon, of the University of Chicago, discussed the application of the second law of thermodynamics to spatially nonuniform systems in which irreversible processes are occurring. He also pointed out the relation between dissipation of energy and biochemical irreversibility.

Karl Menger, of the Illinois Institute of Technology, developed a system of statistical geometry in which the exactly specified distances of ordinary geometry are replaced by distances with a “probability spread.” He suggested applications to a “physiological geometry of the skin,” where only the approximate position of the stimulus is known by the subject.

A. Rapoport and A. Shimbel, of the University of Chicago, developed a theory of random nets and showed its applications to the structure of the central nervous systems and to the spread of epidemics. For example, in a thoroughly mixed large population the fraction of the population succumbing to a contagious disease that confers immunity on the survivor can be expected to be independent of the size of the population.

Paul Lazarsfeld, of Columbia University, dealt with a problem of social science in which the parameters of the “latent classes” into which a population is assumed to be divided are to be computed from data relating to certain responses which various proportions of the population give in different situations. N. Rashevsky, of the University of Chicago, considered the effects of imitative behavior in large social groups, indicating applications of this theory to the study of mob behavior, spread of panics, fads, etc. H. G. Landau, of the University of Chicago, discussed the structure of animal societies as determined by certain dominance relations (such as the so-called peck right observed among chickens).

Leslie F. Nims, of Yale University, presented a study of decompression sickness associated with high-altitude flying in the light of a theory which relates the sickness to bubbles growing in tissues and subjecting neighboring tissues to mechanical stress, as the atmospheric pressure decreases. The mathematical problem is to determine the stresses as a function of time, the partial pressures of the dissolved gases, and the elasticities of the particular tissues.

Boyd Harshbarger, of Virginia Polytechnic Institute, presented a problem in biometrics relating to experiments where a number of varieties, say, of plants, are subjected to a number of treatments. If the number of varieties or treatments is a product of two consecutive integers, formulas are obtained for the making of the experimental design.

H. D. Landahl, of the University of Chicago, discussed theoretical and experimental aspects in the removal of airborne matter by the human respiratory tract. I. Opatski, of the University of Chicago, presented two papers, one dealing with the calculation of the velocity

of nervous conduction, the other with the dose-frequency curves in radiobiology.

George Sacher, of Argonne National Laboratory, treated the problem of physiological injury in a population of animals subjected to a given treatment. Usually the incidence of injury due to some factor (toxic or radioactive) is thought of as depending partially on the individual's functional response and partially on a random factor. Species comparisons show that interspecies predictions of toxicity require a knowledge of the species parameters of the random process, as well as of the functional response.

A. RAPOPORT

### National Association of Biology Teachers (FG 4)

More than 200 members of the National Association of Biology Teachers were present for the six program sessions, annual luncheon, field trip, and the meetings of the Board of Directors.

Highlights of the program were addresses by Clyde A. Erwin, State Superintendent of Public Instruction of North Carolina; May R. Zelle, Division of Biology and Medicine, Atomic Energy Commission; Ernest Neal, Tuskegee Institute, Alabama; Edgar Martin, of the U. S. Office of Education; and the demonstrations of special techniques by T. Edward Boardman, of the Rochester Museum, and Glenn W. Blaydes, of Ohio State University.

The survey of science teaching reported by Dr. Martin indicated that attendance in biology classes now exceeds that of all other sciences in the high schools of the nation. This was a particular challenge to NABT, since it is the only national organization devoting all of its efforts toward improving biology teaching.

Important new committees were appointed by incoming President Richard L. Weaver, of North Carolina, in the fields of outdoor and conservation education; a liaison committee to work with other educational and scientific groups to develop and improve the teaching and the facilities for biology was also appointed.

A new regional and state organization was developed to assist in the promotion of regional and state programs and membership work.

BETTY LOCKWOOD, *President*

### Section on Botanical Sciences (G)

In recent years Section G has kept its program limited to such features as a vice-presidential address and a single symposium of general interest. This year the section organized five sessions, three of which were devoted to symposia and two to contributed papers. The program had a strong ecological flavor, for one of the sessions of 11 contributed papers and the symposia on The Ecological Background of Evolution and The Structure and Analysis of Plant Communities were largely in this field. The Ecological Society of America cosponsored these programs. This year it is expected that the symposia will be concerned with other fields of general interest.

Without making a drive to obtain contributed papers, or in any way competing with society meetings to be held separately from the AAAS, Section G will provide for as many sessions of contributed papers as required at the Philadelphia meeting in 1951. The section will also welcome the cosponsorship of programs by any interested society.

Attendance at the different sessions of the section ranged up to 125 at the symposium on the ecological

background of evolution. It is anticipated that the attendance at the Philadelphia meeting will be larger. Apparently some botanists did not attend the Cleveland meetings because they thought the presentation of papers by botanists had been pretty well cared for at Columbus, and that the section would not "put on" a program. There seemed to be, however, a consensus that the Cleveland meetings were interesting and worth while, and this feeling will probably encourage a larger attendance at Philadelphia. Many of us believe that the volume of American botanical research is sufficient to support two annual meetings of medium or even large size, especially if they are not held in localities that are geographically close.

The programs of Section G were scattered through the period of the meetings with three vacant half-days. This was intentional, the purpose being to make it easier for botanists of wide interests to attend nonbotanical programs of interest to them without serious conflict.

At a Section G business meeting Wednesday evening Vice-President J. S. Karling spoke on "The Future of Section G and Botanical Meetings." This was followed by a general discussion by those in attendance, including officials of the AAAS and the AIBS, with the result that there was a helpful "clearing of the air" and a general feeling that the two organizations will plan for the future with full cooperation.

STANLEY A. CAIN, *Secretary*

### Section on Anthropology (H)

One fact concerning the sessions of Section H at the 117th meeting of the Association dominates all others. That is the spectacular recent growth of anthropology and the degree of its integration with other sciences. No meetings of comparable size have been held by Section H since the American Anthropological Association decided to hold its own annual meetings, which have ordinarily fallen on the same dates and apart from those of the AAAS. Despite the valiant efforts of its secretaries, the sessions have been few and the attendance poor. At Boston, in 1946, five papers were presented to an audience of about a dozen people. The gain since then has been steady. At Cleveland, in 1950, with not a single department of anthropology in the city and, to the best of my knowledge, not a single anthropologist resident there, sessions covered three days, December 28-30, with 29 persons participating directly in the program. A core group of at least 40 anthropologists was present, and attendance at some sessions ran well above 100. This increase reflects the gains in personnel, which now permit anthropology to maintain two major meetings at the same time, and the growing interest in cross-disciplinary studies and the cross-fertilization of the sciences.

A further factor, especially emphasized at the 1950 sessions, is the continually closer relationships being set up between scientists and men of practical affairs. Thus, in addition to the cooperation of various universities and of the Society for Research in Child Development and the Society for Applied Anthropology, with both of which joint sessions were held, the section wishes to express its deep appreciation for the cooperation of the Association on American Indian Affairs; the E. D. Chapple Company, New York; the Foreign Service Institute of the Department of State; the Department of the Interior; and the Division of Trusts of the United Nations. The full-day symposium on the Administration of Native Peoples, December 29, benefited particularly from this coopera-



tion. The discussion following the symposium was unusually fruitful. Both during the discussion and in several of the papers, the point was strongly made that no relationship between groups of persons can be a healthy one if it insists upon a one-way flow of benefits or influences. Materials presented from studies made among American Indians and in Mexico, Samoa, South Asia, and Africa all illustrated the observable effects of interaction. It is clear that, if we are to take advantage of results from the human sciences, we must allow for considerable give and take in administration, and in the contact between nations.

There is no need to review the Section H program here, since it appears in detail elsewhere, but the tremendous success of the session on Linguistics and Anthropological Theory cannot go unnoticed. It has been the experience of Section H that sessions on theory or on subjects which aim at the assessment of the scientist's role in society are of especial interest to members of the AAAS. This seems peculiarly fitting. It is also, however, an indication to be viewed with considerable satisfaction.

In closing any résumé of the 117th meetings, mention should be made of the fact that Section H sessions ran smoothly, giving proof of the skill with which the Cleveland meetings were organized.

MARIAN W. SMITH, *Secretary*

### Section on Psychology (I)

One of the major features of the Section I program consisted of a series of seminars in which the research of psychologists in military agencies, other governmental agencies, and industrial concerns was reported. Reports were given of the type of work conducted, and the kinds of problems encountered in psychological research for the Air Force, the Navy the Army, in various governmental public services, and in private psychological consulting firms. These seminars served to give the audience a good understanding of the structure of psychological research in these various institutions.

The program on The Functions of the Frontal Lobes in Behavior was particularly well attended. This program consisted not only of reports of research from psychologists and neurologists, but it also provoked a considerable amount of discussion between the participants and the audience.

The new section *vice president* is Paul R. Farnsworth, who replaces the retiring vice president, Douglas Fryer.

DELOS D. WICKENS, *Secretary*

### The National Academy of Economics and Political Science (K2)

The National Academy of Economics and Political Science met in the Pine Room of the Statler Hotel, Wednesday morning, December 27. The general subject of the meeting was "Industrial Research." Papers were presented by John A. Leermakers on "Basic Research in Industry," by Thomas J. Killian on "Governmental Contracts for Industrial Research," and by John A. Dienner on "Patents and Industrial Research." The presiding officer for the session was Benjamin H. Williams, chairman of the Board of the National Academy and a staff member of the Industrial College of the Armed Forces, who presided in the absence of S. Howard Patterson, professor of economics, University of Pennsylvania.

The session was designed as an attempt to define the relatively new field of industrial research, and to outline

the important aspects that relate to it in governmental relations through contracting for research and through patents. Basic research, or the contribution to "pure" science made in product research, was given especial attention, functionally and institutionally. The papers presented at this session of the National Academy will provide, in part, the contents of the June 1951 issue of the quarterly journal *Social Science*.

The next sessions of the National Academy of Economics and Political Science will be held in the early spring of this year on a subject yet to be announced. These sessions will constitute the twenty-eighth regular annual meeting of the Academy, and they will be held at the Brookings Institution, Washington, D. C.

DONALD P. RAY, *Executive Secretary*

### Pi Gamma Mu (K3)

A Pi Gamma Mu luncheon was held in the Tavern Room, Hotel Statler, in Cleveland at noon on Wednesday, December 27, in honor of officers and speakers in the session just preceding, of the National Academy of Economics and Political Science, and of officers and speakers on other Section K programs.

The guest list included: E. W. Burgess, Chairman of Section K; Margaret Mead, Chairman of Section H; Raymond L. Taylor, Assistant Administrative Secretary, AAAS; Benjamin H. Williams, chairman of the National Academy of Economics and Political Science; Donald P. Ray, executive secretary of the National Academy of Economics and Political Science; Thomas J. Killian, Office of Naval Research; J. A. Leermakers, assistant director of research, Eastman Kodak Company; John Astor Dienner, of Brown, Jackson, Boettchner, Dienner; James A. Quinn, professor of sociology, University of Cincinnati; Harold M. Mayer, professor of geography, University of Chicago; Derwent Whittlesey, professor of geography, Harvard University; Charles B. Ketcham, president, Mount Union College; Mrs. Charles B. Ketcham; Mrs. Charles J. Bushnell, of Toledo; Elsie B. Stewart, employment interviewer, Ohio Bureau of Unemployment Compensation, Cleveland; Henry M. Muller, professor of sociology, Allegheny College; William W. Martin, national second vice president of Pi Gamma Mu; James J. Hayden, general counsel of Pi Gamma Mu; W. Leon Godshall, chancellor of the Eastern Region of Pi Gamma Mu; Andrew J. Kress, chancellor of the Atlantic Region of Pi Gamma Mu; Edward W. Carter, editor of *Social Science*; and Mrs. Effie B. Urquhart, national executive secretary of Pi Gamma Mu.

William W. Martin welcomed the guests and introduced Charles B. Ketcham, who presided. Dr. Ketcham introduced the guests and asked for brief talks from Drs. Mead, Burgess, and Williams. The talks were followed by informal discussion.

EFFIE B. URQUHART, *National Executive Secretary*

### History of Science Society (L1)

The new officers of the History of Science Society, whose elections were announced at the annual business meeting on December 29, are Harcourt Brown, president, of Providence, R. I.; Dorothy Stimson, of Baltimore, Md., and Henry Guerlac, of Ithaca, N. Y., vice presidents; Carl Boyer of Brooklyn, N. Y., I. E. Drabkin of New York City, Max Fisch, of Urbana, Ill., Charles D. O'Malley of Stanford University, Cal., and Marjorie Nicolson of New York City, as members of the council. The presi-



dent and vice presidents will serve through December 1952; the members of the council will serve through December 1953. The council appointed Frederick G. Kilgour, of New Haven, Conn., to serve as secretary-treasurer through December 1952.

At the request of several Connecticut members, the council approved the establishment of a Connecticut Section of the society.

The council accepted an invitation from Brown University to hold its next meeting at Brown in the spring of 1952. The council also expressed the desire to cooperate with the American Association for the Advancement of Science and the American Historical Association in planning history of science programs for their annual meetings in December 1952.

FREDERICK G. KILGOUR, *Secretary-Treasurer*

## Philosophy of Science Association (L2)

The joint meetings of Section L and the Philosophy of Science Association were held on December 29 and 30.

The Friday afternoon meeting was concerned with the philosophical problems in connection with the second law of thermodynamics (in particular, with the end of the universe), as well as the problems of covariance and timeless laws. The Friday evening session consisted of a discussion of methodology in psychoanalysis and the, as yet, unanswered questions which psychoanalytical method faces. The Saturday morning session consisted of a discussion of a method of study of national character and the crucial problems of prediction and understanding involved in this very difficult phase of research. The Saturday afternoon session was a discussion of the nature of law in the sciences and the problem of the isomorphism of language and reality. Philipp Frank was elected to an additional three-year period on the Governing Committee of the Philosophy of Science Association. The meeting nominated Henry Margenau as president of the association.

C. WEST CHURCHMAN, *Secretary*

## Section on Engineering (M)

During the past year Section M has continued its policy of encouraging the various affiliated engineering societies and the local engineering group to take an active part in the program at the annual meeting. In January 1950 the several affiliated societies and the local engineering group in Cleveland were invited to take part in developing our program. The American Society of Mechanical Engineers has under consideration a plan of joint cooperation at our annual meetings, and, in return, Section M would cosponsor a group of sessions at the annual meetings of the ASME. We hope this plan of cooperation will spread to the other affiliated societies.

At the annual meeting of the ASME in New York, November 27-December 2, 1950, Section M cosponsored eight sessions of the Applied Mechanics group of the ASME. These sessions were highly successful and drew a large attendance.

At the annual meeting of the AAAS in Cleveland, December 26-30, the following organizations joined with Section M in developing our program.

The Cleveland Engineering Society  
The Cleveland Section of the American Society of Mechanical Engineers  
The Case Institute of Technology  
Section K of the AAAS  
The Scientific Research Society of America

The general topic of the Section M program was "Partnership of Science and Engineering in Research." Eight sessions were arranged, and a total of 18 papers was presented by well-qualified experts in their fields. Three of the speakers made front page news in the local press. Section M extends its thanks to the various speakers who presented papers at the meeting. The section is also greatly indebted to the following individuals who developed the program and presided at the various sessions.

K. W. Miller, Armour Research Foundation, Illinois Institute of Technology, who served as general chairman of the Friday symposium

Irving P. Orens, Newark College of Engineering, Newark, N. J., who developed the Friday morning and afternoon programs on Nuclear Engineering, and presided at these sessions. Dr. Orens is also a member of the Executive Committee of Section M

D. B. Prentice and G. A. Stetson, of the Scientific Research Society of America

John W. Greve, associate editor of *Machine Design*, and his associates of the Cleveland Engineering Society

Elmer Hutchisson, Dean, Case Institute of Technology

Roger W. Bols, associate editor of *Machine Design*, and his associates in the Cleveland Section of the American Society of Mechanical Engineers  
G. Edward Pendray, Pendray and Company, New York, a member of the executive committee of Section M who organized the program in Social Physics

Duane Koller, of Wabash College, who presided at the Social Physics Session

The annual meeting of the Executive Committee of Section M and of the representatives of the affiliated societies, scheduled for Tuesday afternoon, December 26, at Cleveland, was adjourned for lack of a quorum. The following are the officers and Executive Committee of the section for 1951: *vice president and chairman*, Boris A. Bakhmeteff, New York City; *retiring vice president*, Morrough P. O'Brien, Berkeley, Cal.; *secretary*, Frank D. Carvin (1952), Chicago, Ill.; *executive committee*, John I. Yellott (1951), Baltimore, Md., Irving P. Orens (1952), Newark, N. J., G. Edward Pendray (1953), New York City, and Henry B. Allen (1954), Philadelphia, Pa.

The Section M Committee also includes representatives of the 17 affiliated and associated engineering societies.

The annual meeting of the association for 1951 will be held in Philadelphia, Pa., during the week of December 26. The tentative program plan for Section M should include the following:

1. A continuation of the sessions on Nuclear Engineering under the direction of Irving P. Orens, of the Newark College of Engineering

2. A continuation of the sessions on Social Physics in cooperation with Section K and under the direction of G. Edward Pendray of New York

3. A committee representing the various engineering colleges in the Philadelphia area should develop several sessions

4. The various engineering societies and organizations in the Philadelphia area will be invited to cosponsor several sessions

The secretary will welcome additional suggestions as to program material for this meeting. Representatives of the various affiliated societies are requested to secure the cooperation of their societies in developing our program and in obtaining publicity through their society publications.

FRANK D. CARVIN, *Secretary*

## Section on Medical Sciences, Medicine (Nm).

The program of Section Nm was devoted to a symposium of 23 papers on the biological effects of radiation. The first two of the four sessions were prepared under the joint sponsorship of Section F and the American Society of Zoologists, and were composed of papers on the effects of ionizing radiation on plant growth, bacterial mutation, certain chemical compounds, and on genetic patterns in plants and mammals, as well as studies of the factors influencing the sensitivity of living cells to radiation. The third and fourth sessions included discussions of the effects of x-rays and radioactive isotopes on various mammalian organ systems, and of measures found to offer protection against radiation injury.

Although attendance at the sessions was below expectations, the papers were all excellent and were discussed extensively. The chairman of the section, Joseph Hinsey, of Cornell University Medical College, presented an address on the problems of medical education in a period of national emergency. His discussion of this serious problem deserves wide circulation and will, we hope, be published in an early issue of *SCIENCE*. The secretary, on behalf of the Section Committee, wishes to express his sincere appreciation to the contributors, program chairmen, and numerous advisors whose cheerful cooperation made the symposium possible.

G. K. MOE, *Secretary*

## Subsection on Dentistry (Nd)

This year Subsection Nd (dentistry) devoted the entire session to a presentation of the researches in the field of dentistry that are being carried on by various governmental agencies. On Friday evening the National Institutes of Health were represented by H. Trendlay Dean, director of dental research, who outlined the various activities of the Institutes related to dentistry. These included the following:

1. Studies of the effect of addition of sodium fluoride to communal drinking waters for the control of dental caries. The reports of these studies are very encouraging.
2. Studies of the epidemiology of periodontal disease.
3. Studies of oral bacteriology, including the metabolism of bacteria, their relation to sugars, calcium salts, and yeast, classification of types of oral *L. acidophilus* and other organisms. He stated that oral penicillin had been used in 160 children, and that caries was significantly decreased but the *L. acidophilus* counts had not been reduced.
4. Studies of fluorine in the urine in relation to dental caries. It was found that fluorine content of the tooth is an inhibitor of dental erosion.
5. A study of the relationship of oral spirochetes to gingivitis. By tissue sections it was found that spirochetes invade the soft tissues, and this process is associated with the presence of hyaluronic acid.

As a part of Friday evening's program R. Leas, chairman of the Committee on Civilian Defense in the Cleveland Academy of Medicine, discussed the role of dentistry in atomic warfare.

Saturday morning the Navy was represented by C. A. Schlnack, who reported a wide range of studies being conducted under his direction. Among these are: (1) studies of growth processes in the dentin by animal experiments; (2) studies of altitude pain in teeth; (3) studies of jaws from Bikini for evidence of radiation changes; (4) studies of air-, water- and food-borne infections and the antiseptic processes of the saliva. He also reported that 22 studies, supported by the Navy, are now in progress in various universities. These are in the biologic, metallurgic, and technical fields.

The Veterans Administration was represented by H. T. Bartleson, who reported experiments on the permeability of human enamel by means of  $I^{131}$ . He showed passage of the solution centripetally through the enamel when applied to the surface of a tooth, as demonstrated by Geiger counter readings over the thyroid gland. He also showed radioautographic evidence of the penetration of the enamel, dentin, the periodontal membrane, the alveolar bone, and the gingivae.

Saturday afternoon the Armed Forces Institute was represented by J. L. Bernier, who presented statistical analyses of epithelial malignancies. These were based on 1,400 cases of lip, oral, and pharyngeal lesions, with special reference to their location, etiologic factors, and hereditary history. This study is in progress, and no conclusions were drawn.

The Army Medical Research Center was represented by G. W. Burnett, who gave his findings in a study of the proteolytic organisms found in the deeper layers of dental caries lesions. He isolated several filamentous organisms and evaluated their action on the dentin.

The Air Force was represented by H. B. Palmer, who reported a comprehensive study of the solubility of teeth in acids produced by *L. acidophilus*. He found marked differences in the solubility of enamels in different individuals and in the same individual. He found no relationship between enamel solubility and susceptibility to dental caries. He reported evidence that the upper teeth are more prone to caries than the lower, and that there is a slight difference between the right and left sides of the mouth.

R. W. BUNTING, *Secretary*

## Subsection on Pharmacy (Np)

The subsection held four sessions during the Cleveland meeting. The first two were devoted to papers reporting original research; the last two consisted of a Hospital Pharmacy Seminar.

R. F. Prindle, of Strong, Cobb & Company, Inc., Cleveland, presented data showing the stability of various vitamins in a variety of pharmaceutical products. The behavior of vitamin A, thiamine, ascorbic acid, calcium pantothenate, and niacin and niacin amide was described. Stability studies on tablets, liquids, hard and soft capsules at room temperature and under accelerated storage conditions, and the effect of common excipients such as mineral salts, liver preparations, and coating materials were reviewed.

L. March and R. F. Prindle described a rapid, accurate, and specific colorimetric method for the determination of ferrous and ferric gluconate. A method based on the color developed by the addition of  $\alpha,\alpha'$ -dipyridyl was found to be applicable to a wide variety of pharmaceutical preparations, and evidence was presented showing the stability of ferrous gluconate in both tablets and liquids under accelerated and room temperature storage conditions.

F. Skelton and G. A. Grant, of Ayerst, McKenna and Harrison, Ltd., Montreal, showed that some alkyl sugar derivatives have interesting diuretic properties that make them of potential usefulness as therapeutic agents.

R. A. Ravieh and E. Reviei, from the Institute of Applied Biology, Brooklyn, described the effect of *n*-butanol in sodium salt solutions upon shock and survival of mice exposed to severe extensive thermal burns. They presented

evidence that *n*-butanol has definite value as a therapeutic agent, and since improved burn therapy may be important in the event of atomic warfare, their findings take on unusual importance.

P. M. Scott, L. D. Edwards, and J. E. Christian studied the penetration of certain sodium alkyl sulfates and sodium sulfate through rat and mouse skin. Each of these sulfates was labeled with S 35, and it was found that the short-chained alkyl sulfates penetrated at a greater rate than the long-chained sulfates, and that sodium sulfate penetrated at a rate dependent upon the concentration of the applied material. Massage increased this rate of penetration. Furthermore, there was occasionally evidence from radioautographs of skin sections that penetration of the skin was by way of the hair canals and follicles.

J. E. Christian, J. J. Pinajian, and W. E. Wright, of Purdue University School of Pharmacy, described an isotope dilution procedure of analysis involving direct and inverse isotope dilution. The method is stated to have many possible applications to analytical problems that cannot be solved in any other manner and to problems that are difficult by usual procedures. The method should find extensive applications in many fields of analytical chemistry, including pharmaceutical analytical chemistry.

A. R. Biamonte and G. H. Schneller, of the American Cyanamid Company, Calco Chemical Division, Bound Brook, N. J., reported their study of the stability of folic acid in solutions of the B complex vitamins. The stability of folic acid was studied at pH values between 3 and 7 in liquid media containing individually and conjointly thiamine hydrochloride, riboflavin, nicotinamide, pyridoxine, and pantothenyl alcohol. At the lower pH levels where water or sucrose syrup was used as a vehicle, the folic acid was largely undissolved, whereas at the higher pH levels, the folic acid was completely dissolved. In a mixture of propylene glycol and water, the folic acid was completely dissolved throughout the entire pH range. In general, riboflavin and thiamine caused considerable decomposition of folic acid in solution. Specimens at the lower pH levels exhibited a stability that might be practical for pharmaceutical compounding purposes. Nicotinamide, pyridoxine, and pantothenyl alcohol did not materially affect the stability of folic acid in solution. The decomposition of folic acid in the presence of riboflavin and thiamine involves cleavage at the methylene linkage, liberating para amino benzoyl glutamic acid. This is analogous to the reaction that takes place upon the acid reduction of folic acid used in the chemical determination of this substance.

S. D. Bailey, P. A. Geary, and A. E. DeWald, of the Research Division, Smith, Kline and French Laboratories, Philadelphia, gave the results of ultraviolet, infrared, and polarographic studies on three principles isolated from Ammi Visnaga. They found that infrared absorption provides a method for estimating each principle in fractions containing khellin, visnagin, and khellol-glucoside. W. C. Ellenbogen, E. S. Rump, P. A. Geary, and M. Burke found that they could obtain reproducible results using ultraviolet and polarographic methods for determining khellin and visnagin, and showed that the ultraviolet analysis method was the preferred one.

M. G. Girbino, of Strong, Cobb Company, Inc., reviewed analytical problems in pharmaceutical work and pointed out the difficulty of applying the usual methods, since substances that interfere with the determination of the individual components are often present. Reviewed were modifications of known methods or development of new ones, in order to determine within reasonable toler-

ances the active constituent or constituents of various products.

G. C. Walker, H. G. DeKay, and C. L. Porter, of Purdue University, studied the antifungal properties of some antihistamines, finding that with the isolated mycelial disk technique antihistamines showed no fungicidal activity toward *T. mentagrophytes*. The agar cup plate method of fungistatic testing, however, showed all the antihistamines tested possess definite inhibitory activity against *T. mentagrophytes*. Antergan and Phenergan appeared to be the most active of the compounds tested in a nonionic ointment base.

M. R. Loran and E. P. Guth, of Ohio State University, developed a five-phase diagram drawn of the ternary system castor oil, 95% alcohol, and water, and determined the various ratios at which solutions of these three components can be prepared. They illustrated the practical use of the phase rule in pharmacy in the preparation of solutions of two immiscible liquids, utilizing a third liquid that is miscible with both.

The Hospital Pharmacy Seminar on Friday morning was presided over by Mrs. Evelyn Gray Scott, of St. Luke's Hospital, Cleveland. U. S. Army moving pictures were shown depicting the medical effects of the atomic bomb and medical services in atomic disaster. These pictures were followed by a panel discussion on "The Responsibilities of the Pharmacist in Civilian Defense."

The afternoon session on Friday was devoted to the Hospital Pharmacy Seminar, with Don E. Francke, of the University Hospital, Ann Arbor, Mich., presiding. G. F. Archambault, of the U. S. Public Health Service, discussed "The Importance of Amber Glass for Prescription Containers;" B. E. Conley, of the American Medical Association Laboratories, described "Recent Developments in Pesticides;" J. J. Pinajian, of Purdue University School of Pharmacy, explained the factors necessary in establishing a laboratory for radioactive materials in the hospital pharmacy; and V. L. Conley, of the American Medical Association Laboratories, spoke on the "Pharmaceutical Aspects of Sun Screen Compounds."

In general the Hospital Pharmacy seminars were stimulating and well attended by a representative group of hospital pharmacists from the Cleveland area.

GLENN L. JENKINS, Secretary

## Alpha Epsilon Delta (N4)

Problems of premedical education and ways of assuring an adequate continuing supply of medical and premedical students during the present national emergency were discussed at the session of Alpha Epsilon Delta, national premedical honor society, held at the Hotel Hollenden, Cleveland, December 28, during the meetings of the AAAS. About 60 persons were in attendance. Stockton Kimball, dean of the School of Medicine, University of Buffalo, chairman of the Joint Committee of the American Medical Association and the Association of American Medical Colleges on Medical Education in Time of National Emergency, and chairman of the Healing Arts Advisory Committee of the Selective Service, discussed the plans and counterplans affecting medical and college education which are currently under consideration. A plan was submitted by the Joint Committee to NSRB on November 1, which included proposals for the continued education of an adequate number of premedical and medical students. This report has been published as a supplement of the November 1950 issue of the *Journal*

of the Association of American Medical Colleges. A somewhat similar proposal has been made by the Office of Education of the Federal Security Agency. Both these proposals run counter to the program of universal military service advocated by President Conant of Harvard. In discussing these plans, Dean Kimball pointed out that "medical schools cannot continue the uninterrupted training of doctors if their preparation in college is seriously interrupted." The problems of insuring the continuous and adequate education of physicians during the emergency must be solved satisfactorily very soon, said Dean Kimball, "so that this country can discover how to maintain its might and its mind as well."

In summarizing the results achieved at the First National Conference on Premedical Education, H. E. Setterfield, national president of Alpha Epsilon Delta, reported that no attempts are being made to work out a standard curriculum for premedical education, nor should standard requirements or admission procedures be set up for individual medical schools. There is general agreement that students should have a strong, sound liberal education within the traditional concept of the liberal arts college, including an amount of science at least equal to the minimum required for admission to any medical school. It should offer more than that, as education of the student for living, with the development of a high order of intelligence, is the goal to be achieved instead of merely training persons for medical school. Meetings of medical and premedical educators should be encouraged so that each would come to have a better understanding and appreciation of mutual problems and, together, work out and develop a better program of medical education.

It was announced at the meeting that Alpha Epsilon Delta will hold a celebration of its twenty-fifth Anniversary at the University of Alabama, March 21-24, 1951, which will include the Fourth Regional Conference on Premedical Education, organized in cooperation with the University of Alabama. Medical and premedical educators and students from colleges and universities in the southeastern states are invited to attend and participate in the conference.

Those in attendance at the Cleveland meeting urged the society to arrange a formal program during the AAAS meeting at Philadelphia in December 1951.

MAURICE L. MOORE, *National Secretary*

### The American Dietetic Association (N5)

The importance of nutrition in relation to child health was discussed by two speakers at the American Dietetic Association session on December 29. First to speak on this subject was Joseph A. Johnston, director of pediatrics at Henry Ford Hospital, Detroit, Mich., who reported on a study covering a twenty-year period, conducted to discover ways and means of decreasing the incidence of tuberculosis in children. Dr. Johnston stated that an adequate diet, particularly with good retention of nitrogen and calcium, seemed to indicate protection against the disease and beneficial effects in its treatment.

Pauline Beery Mack, of the School of Chemistry and Physics, Pennsylvania State College, reported on a nutritional study of 2,464 children, which she said showed generally haphazard diets, below nutritional requirements.

Helen A. Hunscher, program committee chairman for the session of the American Dietetic Association, presided at the meeting. The Association's representative on the AAAS Council is Clara Mae Taylor, of Teachers College, Columbia University.

The American Dietetic Association plans to participate in the 1951 convention of the AAAS in Philadelphia.

RUTH M. YAKEL, *Executive Secretary*

### Section on Agriculture (O)

In cooperation with Section E, Section O presented a program consisting of three half-day sessions. The central theme was the interrelationship of geology and soil science. Many soil scientists were pleasantly surprised at the attention being given to problems of soil genesis and classification by a number of prominent geologists. In a number of instances geologists and soil scientists are working in close cooperation, but there is need for more cooperative effort in this field. The papers presented evoked considerable discussion, and there were several expressions of a desire for a similar program at some future meeting. The papers were well illustrated with slides and charts.

The programs were quite well attended—60-70 listened to the Thursday afternoon papers, and approximately 40 attended each of the two sessions on Friday. Richard Bradfield, of Cornell University, presided at the Thursday and Friday afternoon sessions, and M. M. Leighton, of the Illinois State Geological Survey, served as chairman Friday morning.

V. A. Tiedjens is chairman of Section O for the year 1951. Our program for the Philadelphia meeting is being developed around the general subject of "Soils and Health." The papers will cover plant nutrition, as well as the nutrition of animals, including man. The relationship of soil composition and treatment to plant composition and the health of both plants and animals will be considered. A number of the most prominent workers in the field of plant and animal nutrition have already consented to present papers.

C. E. MILLAR, *Secretary*

### Section on Education (Q)

Section Q undertook the most ambitious program it has had for several years. There were eight sessions including the joint session with Section I, at which the vice-presidential addresses of the two sections were given, as well as the symposium arranged for Section Q by the Foundation for Integrated Education. Attendance was larger than it has been in any recent year.

The symposium on integrated education was an especially interesting one and included a statement of the general objectives of integrated education, discussions of the technique in securing the cooperation of faculties, and illustrations of an extended research concerned with the concept of integrated education and the special ways in which integration can be secured among sciences.

Another symposium of Section Q related to visual performance as applied by industrial and educational management. This symposium evaluated visual screening tests and discussed both the medical and technical aspects of visual standards and performance in certain occupations with respect to susceptibility to accident and the like.

Five sessions were given over to the reading of papers. One of these sessions related primarily to philosophical and theoretical aspects of education. Two of them were organized by the officers of the American Educational Research Association, an affiliated society. Papers covering a wide range of topics were presented; for example, methods of teaching science at the kindergarten level were presented, and examples were given of the applications of educational concepts to industrial management. Teach-



ing procedures in colleges and universities and the relationship of intelligence as a factor in learning through the use of audio-visual aids were reported. An especially interesting discussion involved the effect of television on the attainment and personal adjustment of school children. The vice-presidential address by Dr. Johnson was an unusually scholarly presentation of the place of statistical science in educational research.

A proposal for a new section on literature science was received with a great deal of enthusiasm. There was also a symposium on teacher training and teachers' workshops prepared by the Cooperative Committee on the Teaching of Science and Mathematics. In general, it is felt that this was one of the most successful meetings Section Q has had.

D. A. WORCESTER, *Secretary*

### AAAS Cooperative Committee on the Teaching of Science and Mathematics (Q1)

The Committee arranged one of the AAAS Symposia dealing with "Teacher Training and Teachers' Workshops," which was presented as part of the joint program of the Science Teaching Societies affiliated with the AAAS.

Francis W. Sears, professor of physics at MIT, told of the summer workshops for secondary school teachers of physics which have been sponsored jointly by the Westinghouse Educational Foundation and the Massachusetts Institute of Technology. Leonard O. Olsen, professor of physics at Case Institute of Technology, told of the joint scholarship program for secondary school teachers of physical science sponsored jointly by the General Electric Corporation and Case in Cleveland, and by General Electric and Union College in Schenectady.

R. S. Poor, chairman of the University Relations Division, Oak Ridge Institute of Nuclear Studies, discussed the in-service training program for college teachers, provided for in the laboratories of the Atomic Energy Commission.

Morris Meister, principal of the Bronx High School of Science in New York City, a long-time member of the Cooperative Committee representing the National Science Teachers Association, has been elected chairman to succeed Karl Lark-Horovitz who resigned the chairmanship as of November 1. Dr. Lark-Horovitz was a charter member of the committee, which was organized in 1941, and had been its chairman for the past six years.

R. W. LEFLER, *Retiring Secretary*

### American Nature Study Society (X1)

Use of varied resources for the enrichment of the teaching of nature and science featured the sessions of the American Nature Study Society, meeting jointly with the National Association of Biology Teachers and the National Science Teachers Association. Combined sessions of all three societies were held at the morning meetings, with the individual organizations holding their own afternoon sessions.

Trailside museums, conservation field trips, school gardens, pond exploration, winter outdoor resources, caves, reptiles and amphibians, and photography were among the fields covered by the speakers. Most of the papers were

dramatized by being accompanied by excellent colored slides or motion pictures, picturing in a practical way the employment of these fields of interest in nature education.

One especially effective demonstration on the program was by Cleveland schoolchildren under the direction of Mrs. Grace Maddux. The youngsters demonstrated a conservation knowledge that would be the envy of many adults. Other speakers included Harold Wallin, curator of education of the Cleveland Museum of Natural History; Robert R. Finlay, conservation instructor, John Marshall High School, Cleveland; Paul R. Young, school garden supervisor of the Cleveland Board of Education; H. Raymond Gregg, chief naturalist, National Capital Parks; Charlotte Hilton Green, Raleigh, N. C.; Gertrude McWebb, of the Cleveland Heights schools; Charles E. Mohr, director, Audubon Nature Center, Greenwich, Conn.; James A. Fowler, director of education, Philadelphia Academy of Natural Sciences; E. Laurence Palmer, professor of nature and science education, Cornell University; Mrs. Warner Seely, Cleveland Bird Club. At the annual banquet Arthur A. Allen, professor of ornithology, Cornell University, presented the pictorial story of the discovery of the nest of the bristle-thighed curlew. A field trip on Saturday to two sections of the Cleveland Metropolitan Park System drew 84 participants under the leadership of Ellis Persing, Roger Tory Peterson, Harold Wallin, and Joseph Maddox.

Officers elected for 1951 were Ellsworth Jaeger, curator of education, Buffalo Museum of Science, president; Roger Tory Peterson, naturalist, artist, and author, vice president; Edward T. Boardman, Rochester (N. Y.) Museum, secretary; H. Raymond Gregg, treasurer. Elected to the board for two-year terms were Richard L. Weaver of the North Carolina Department of Public Instruction; Charles E. Mohr; Edwin Way Teale, author-naturalist; Eva Gordon, Cornell University; Richard W. Westwood, president of the American Nature Association, editor of *Nature Magazine*, and retiring president of ANSS. W. Hughes Barnes, of Muskingum College, was named chairman of the membership committee; Mr. Westwood, chairman of the conservation committee; Ruth Hopson, of Eugene, Ore., representative of the western branch of ANSS; and E. Laurence Palmer, AAAS representative.

RICHARD L. WEAVER, *Retiring Secretary*

### Phi Beta Kappa (X6)

At the December 1950 meeting of the AAAS in Cleveland, Phi Beta Kappa sponsored an address by Detlev W. Bronk, who spoke on "Science and the National Welfare" on Friday evening, December 20, in the Grand Ballroom of the Hotel Statler. The chairman of the Phi Beta Kappa session was Raymond Walters, president of the University of Cincinnati, who introduced Dr. Bronk and gave a short talk on "Science and Humanism." More than 225 delegates to the AAAS sessions, and members of Phi Beta Kappa living in the Cleveland area, attended the meeting. In addition to Drs. Walters and Bronk, guests of honor were Kirtley F. Mather, 1951 president of the association, and Milton F. Brightwell, president of the Cleveland Phi Beta Kappa alumni association.

CARL BILLMAN, *Secretary*



# News and Notes

## Pan Indian Ocean Science Congress

N. R. Srinivasan

*Department of Metallurgy,  
Indian Institute of Science, Bangalore, India*

THE first session of the Pan Indian Ocean Science Congress was held in the Indian Institute of Science, Bangalore, January 2-10. Pandit Jawharlal Nehru, Prime Minister of India, inaugurated it in a colorful ceremony attended by some 30 delegates from Australia, New Zealand, Burma, Malaya, Ceylon, Madagascar, the Netherlands and Portugal. Scientists from the United Kingdom included P. M. S. Blackett, R. S. Pierls, and L. Rosenfeld. F. Perrin, French Atomic High Commissioner, L. Fieser, and G. Wentzel, of the U. S., who came for the 38th Indian Science Congress, also attended. The increasing importance of science in the Far East had culminated in a proposal made by the Australian Council of National Research to hold a congress of scientists of the countries around the Indian Ocean in an endeavor to solve problems of mutual interest. The government of India evinced keen interest and invited the first session to India. H. J. Bhabha, cosmic ray expert and president of the Indian Science Congress, was elected the first president of the Pan Indian Ocean Science Congress.

The delegates presented in all 19 papers, most of which came from Australia. The papers pertained to the physics of rain formation and radio-frequency radiation from the galaxy, by E. G. Bowen; soils of Australia, by B. E. Butler; "Australian Aboriginal Culture and the Orient," by A. P. Elkin; "Some Aspects of Plant Genetics," by A. J. Millington; "The Green Flash at Sunset," by A. D. Ross (leader of the Australian delegation and observer for New Zealand); and "Endocrinology of the Thyroid and Pituitary Glands," by V. M. Trikojus. J. Millot, of Madagascar, presented papers on "Erosion, Excavations and Research in Entomology in Madagascar." Professor Mahadevan, of India, gave a paper on "Recent Advances in Gondwana Geology." The delegates also gave special talks and popular lectures, which were highly appreciated.

The interim constitution of the Pan Indian Ocean Science Congress was drafted after considerable discussion. It was decided that the congress should meet at intervals of not less than two years; the next meeting is scheduled to take place in Australia in the middle of 1953. The General Council will consist of the following: H. J. Bhabha (India), president; A. D. Ross (Australia), Ba Thi (Burma), N. G. Baptist (Ceylon), J. Millot (Madagascar), Professor Robinson (Malaya), H. A. Ferreira (Portugal); and B. Sanjiva Rao (India), secretary.

Membership in the congress will be open to independent countries bordering the Indian Ocean, and the congress will undertake cooperative work in several fields of science. In the physical sciences recommendations will be made by the participating countries for new research work of potential significance. In the biological sciences a section will be devoted to matters connected with public health and nutrition, and liaison will be established with international organizations such as WHO. In the agricultural sciences, to increase agricultural production and raise the standard of living, it was decided to have a free exchange of personnel and information. In the social sciences, population studies, and surveys of education, cultural amenities, national incomes, and related fields will be undertaken. In order to add to fundamental knowledge concerning the Indian Ocean in all its aspects, the congress urged close cooperation in studying geography and oceanography between the governments of the bordering countries.

In concluding the session, the president said that much could be done by close scientific cooperation among different countries. Dr. Ross said that there was much in common among the countries bordering the Indian Ocean, and that mutual help will result in national prosperity for all of them.

The delegates were taken on a tour of places of ornamental and historical interest in the State of Mysore and other parts of the country. Visits to industrial concerns and educational institutions were arranged, and the delegates were also entertained at several "At Homes," heard Indian music, and saw performances of native dances. The first session of the Pan Indian Ocean Science Congress can be considered to be a success, and a vast opportunity lies before the organization to contribute to prosperity in the Far East.

## Scientists in the News

Fernando Albuquerque, director of the National Council of Geographers, Rio de Janeiro, has been in Washington, D. C., studying at the Orientation Center of Wilson Teachers College. He will also study cartography at the United States Coast and Geodetic Survey.

W. C. Allee, after serving 29 years in the Department of Zoology at the University of Chicago, has become emeritus professor of zoology. He has been appointed head professor of biology at the University of Florida. At the request of both institutions, he is retaining the position of managing editor of *Physiological Zoology*.

Harwood S. Belding has been appointed professor of environmental physiology, and Maurice A. Shapiro assistant professor of sanitary engineering, in the

Graduate School of Public Health, University of Pittsburgh. Dr. Belding comes to the School of Public Health from the Quartermaster Climatic Research Laboratory, Lawrence, Mass., where he has served as director since 1946. Mr. Shapiro was engineering research associate for the American Public Health Association and previously worked in the USPHS.

M. C. Chang has been appointed supervisor of the Foundation of Applied Research's cattle ova transplantation program, which is designed to enable ordinary scrub cows to give birth to registered, high-quality animals. To date the experiment has produced pregnancies in cattle, but no births. Dr. Chang, who has successfully transferred the eggs of rabbits, has assumed full direction of the project, replacing Raymond E. Umbaugh, who resigned.

Dorothy J. Comins, of the Catalog Division, Army Medical Library, is teaching courses in the newly organized library school at the Sociedad Económica de Amigos del Pais, Havana, Cuba. Arrangements for the assignment were made between the Army Medical Library and the Library of Congress as a part of the program operated with funds transferred from the Department of State under Public Law 402, the purpose of which is the promotion of international understanding.

Two members of the Department of Surgery at the University of Illinois College of Medicine, Vernon C. David and R. J. E. Oden, have been given emeritus status by the Board of Trustees upon reaching their 68th birthdays. Dr. David has held the rank of Rush clinical professor of surgery in the College of Medicine since 1941, having previously served on the faculty of Rush Medical School. Dr. Oden, clinical associate professor of surgery, has been a member of the medical faculty since 1925. Since 1919, Dr. Oden has been an attending surgeon on the staff of Augustana Hospital.

The University of Edinburgh's Senatus Academicus elected Gustav Eglolf, Universal Oil Products Company, to give the biennial "Romanes Lecture in Chemistry for 1951." Dr. Eglolf, vice president of the Third World Petroleum Congress, will attend the congress in The Hague, May 23-June 6, at which time he will lecture on "Polymerization of Olefinic Hydrocarbons."

Frank B. Engley, Jr., has been appointed associate professor of bacteriology at the University of Texas Medical Branch, Galveston. Dr. Engley received his Ph.D. from the University of Pennsylvania, where he was instructor in bacteriology. During the war he served as bacteriologist in the Chemical Corps at Camp Detrick.

Prakrity Kumar Ghosh, of the Geological Survey of India, is spending about two of his four months' UN fellowship grant under the general guidance of the U. S. Geological Survey, observing the latest scientific and technical methods and techniques employed in geological investigations and research, as related to

the discovery and ultimate development of mineral deposits such as iron, manganese, lead-zinc, vanadium, and chromite. The grant was given in connection with the UN Economic Development Fellowship program.

Among foreign visitors at ARA Bureaus in Washington and Beltsville during January were: Sadiq Husain, Ministry of Food and Agriculture, Pakistan; Oddmund Amundstad and Georg M. Ronnevig, Norway; N. Abdullah, Iraq; Sir Stanton Hicks, Australia; and Mitsuo Nakamura, Japan.

Charles D. Kochakian, formerly associate professor of physiology, University of Rochester Medical School, has been appointed assistant director of the Medical Research Institute, University of Oklahoma School of Medicine. Dr. Kochakian is an endocrinologist and physiological chemist and is internationally known for his work on hormones and growth.

Charles E. Loucks is now in command of the Army's chemical center at Edgewood, Md., replacing E. F. Bullene. General Loucks was formerly in charge of the Chemical Division, European Command, and during World War II he directed the Chemical Corps' Rocky Mountain Arsenal at Denver.

John L. McHugh has assumed his new position as director of the Virginia Fisheries Laboratory at Gloucester Point. Prior to accepting this appointment Dr. McHugh was prominent in the direction of the Marine Life Research Program at the Scripps Institution of Oceanography.

David E. Price has been appointed as assistant surgeon general of the Public Health Service and an associate director of the National Institutes of Health. Norman H. Topping, Associate Director of the National Institutes of Health for the past three years, will continue in that capacity and will assist the director, William H. Schrell, with the intramural research program, including the representation of National Institutes of Health interests with other governmental agencies. As associate director, Dr. Price will assist the director in representing the National Institutes of Health in extramural operations, including coordination of the various grants programs, community services, and relations with the various voluntary organizations with which the institutes share mutual interests.

Harold D. Priddle has been appointed to the Wayne University College of Medicine staff as supervisor of a graduate program for specialized training in obstetrics and gynecology. The program has been made possible by a \$10,000 grant from the Michigan Department of Health. Dr. Priddle was formerly on the staff of the Chicago Lying-in Hospital.

Robert Edward Stevenson, formerly with the technical service department of the National Cotton Council of America, has been appointed as textile technologist in the Washington, D. C., office of the USDA's Bureau of Agricultural and Industrial Chemistry. He

will help plan and coordinate investigations at the four regional research laboratories on new and wider uses for cotton and other fiber crops, development of synthetic fibers from agricultural materials, and utilization of straw and other agricultural residues.

**Gilbert L. Woodside** was named dean of the Graduate School at the University of Massachusetts effective November 1 upon the retirement of the present director, **Fred J. Sievers**. The new dean has been head of the state university's Zoology Department since September 1948, and has been engaged in cancer research for several years, in association with **George W. Kidder** at Amherst.

## Grants

**Utah State Agricultural College** has received a grant of \$50,000 from the **Kennecott Copper Corporation**. Half the grant is to support research on the mineral nutrition of plants and animals, with emphasis on chlorosis and related mineral deficiency diseases of horticultural crops, and on a disease of range beef cattle that may be associated with deficiencies of copper and cobalt. The other half will support the breeding program for the improvement of **Rambouillet** sheep, in cooperation with the **Western Sheep Breeding Laboratory**.

The **American Philosophical Society** has announced 16 grants from the **Penrose and Johnson Funds**, of amounts ranging from \$375 to \$5,000. Among the recipients are **Fred Alexander Barkley**, of Argentina; **Howard J. Dittmer**, of the University of New Mexico; **Louis M. J. Schram**, of Arlington, Va.; and **Gerald R. Seaman**, of the Medical Branch, University of Texas, for research in the geological and biological sciences; **Dorothy S. Thomas**, of the University of Pennsylvania, and **Erwin H. Ackerknecht**, of the University of Wisconsin, for work in the social sciences; **Evo-Maria Jung**, of Georgetown University, for research in medical history; **Vilhjalmur Stefansson** for studies in the history of exploration; **Wendell H. Camp** and **Ruth Patrick**, of the Academy of Natural Sciences, for botanical studies; and the University of Pennsylvania Museum for archaeological excavations in Iran and Cyprus.

**Cornell University** announced recently the receipt of a grant of \$325,000 from the **Rockefeller Foundation** to support a broadened program of Southeast Asia studies aimed at greater understanding of the peoples of Thailand, Burma, Indo-China, Malaya, Indonesia, and the Philippines. The program will provide "area and language" training for graduate students who at the same time will be working toward higher degrees in one of the recognized fields of the social sciences, humanities, or natural sciences. Students will be expected to complete their training through actual research experience in the field. The program will be directed by **Lauriston Sharp**, professor of anthropology. A number of graduate fellowships will be offered each year to encourage students who wish to work under the program.

A new program of basic research designed to discover an answer to the cerebral palsy problem has been inaugurated by the University of Illinois College of Medicine, supported by funds from the **Cerebral Palsy Association of Illinois**; \$50,000 has been allocated for a five-year program. The study will be undertaken by **S. N. Stein** and a team of medical investigators in the University's Department of Psychiatry, headed by **Francis J. Gerty**. They plan to map out precisely the site of damage in the brain and the distribution of transmitted impulses from those damaged areas. If this information can be obtained, it is hoped that new methods can be developed along surgical and medicinal lines to aid the afflicted.

**Eli Lilly and Company**, of Indianapolis, has announced that it has approved grants to the following: **Lester D. Odell**, chairman, Department of Obstetrics and Gynecology, University of Nebraska College of Medicine, who will study therapy of the toxemias of pregnancy; **William A. Jeffers**, University of Pennsylvania, who will study cardiovascular drugs; and the Institute for Cancer Research, Philadelphia, for work on the relationships of fungi to tumor growth, under the direction of **Irene C. Diller**.

The **American Heart Association** has set up an international study group to evaluate the effectiveness of **ACTH** and **cortisone** in the treatment of rheumatic fever and the prevention of rheumatic heart disease. The grants have been provided by the **National Heart Institute of the USPHS**. **Armour & Co.** and **Merck & Co., Inc.**, have contributed \$5,000 each and will also supply the hormones. The study will be undertaken through 12 research centers in the U. S., Canada, and Great Britain and will be headed by **David D. Rutstein**, professor of preventive medicine at Harvard Medical School.

## Fellowships

**McCollum-Pratt Institute**, of The Johns Hopkins University, is offering a three-year, postdoctoral fellowship to support a young scientist doing general work in the trace element field. The fellowship was established by **Earle F. Johnson**, a former vice president of General Motors.

A group of electrical contractors in the New York metropolitan area, members of the **Joint Industry Board of the Electrical Industry**, is sponsoring, at Columbia University, a combined labor-management scholarship program, which will entail an annual expenditure of more than \$55,000. The scholarships will be available only to sons of workers affiliated with Local Union No. 3 of the **AFL International Brotherhood of Electrical Workers** who are also members of the industry's pension plan.

**Illinois Institute of Technology** is accepting applications for the **Westinghouse Fellowship** in power systems engineering. The training will include experience with the **A-C Network Calculator**. For application blanks and further information, write to Office

of Admissions, Graduate School, Illinois Institute of Technology, Chicago 16. Applications must be received by March 15.

The State University of Iowa College of Medicine is offering two fellowships, supported by the Medical Service Funds, to graduates in medicine who contemplate academic careers. The salary will be \$3,600-\$4,000 per year. Application blanks, which must be submitted before April 1, may be obtained from the Office of the Dean, College of Medicine, State University of Iowa, Iowa City.

## Colleges and Universities

An Atomic Energy Laboratory is soon to be in operation at Indiana University's Department of Chemistry for research in peacetime uses of atomic energy. The laboratory is being established in co-operation with the AEC, and will be under the direction of Frank T. Gucker, Jr., head of the Department of Chemistry. It will engage in research in the use of radioactive isotope tracers in chemical and biochemical analyses, and in training senior and graduate students in tracer technique. The tracer research will be an expansion of work that has been under way at I. U. for some years. Some of the isotopes used will be produced in the Department of Physics cyclotron. Chemical research will be directed by L. L. Merritt, Jr., assisted by Hans Berneis and Charles Weber. Student training will be under Ralph L. Seifert. Research in biochemical fields will be directed by Felix Haurowitz and Harry G. Day.

Princeton University has acquired the plant and property adjoining the university property formerly occupied by the Rockefeller Institute for Medical Research. It will be converted into a research center in the fields of aeronautical engineering, jet propulsion, chemical kinetics, and related sciences to be established as a memorial to the late James Forrestal. Two three-story major laboratories, and 13 single-story buildings are available for research purposes.

The annual Dairy and Food Inspectors' and Sanitarians' School will be held at Michigan State College on April 10-13. Those interested may obtain full details of the school and a copy of the program by writing to Dr. W. L. Mallmann, Department of Bacteriology and Public Health, Michigan State College, East Lansing.

A training course for cardiovascular investigators, sponsored jointly by the USPHS, American Heart Association, and Western Reserve University School of Medicine, will be held in the Department of Physiology July 1, 1951-June 30, 1952. The course will consist of formalized training in research methods used in cardiovascular research, assisting experienced investigators with current research, independent research under supervision, and experience in the preparation of a manuscript. Although primarily organized for postdoctorate training, a few especially qualified predoctorates may be accepted. Postdoctorate

candidates accepted for training will be recommended to the Director of the National Heart Institute, USPHS, for a research traineeship carrying a stipend ranging from \$3,000 to \$3,600 per annum, depending on marital status. Application blanks may be obtained from Carl J. Wiggers, Program Director, Western Reserve University School of Medicine, Cleveland 6, Ohio.

The Philadelphia Section of the American Chemical Society is sponsoring three special noncredit evening courses to be given at the Philadelphia College of Pharmacy and Science. Two-hour lectures will be given on successive Monday evenings, beginning February 12, on "Chemical Engineering Equipment Design and Cost Estimating;" "Chemistry of Hydrocarbons" will be given on successive Tuesday evenings, beginning February 13; and "Determination of Molecular Structure by Physical Methods" will be given on successive Wednesday evenings, beginning February 14.

The Division of Biological Sciences at the University of Illinois is sponsoring a special series of lectures on evolutionary topics. G. Ledyard Stebbins, Jr., University of California, Berkeley, delivered three lectures: "Natural Selection in Plants," "The Origin of Species in Plants," and "Paleobotany, Plant Distribution, and rates of Evolution" (January 2-6). Ernst Mayr, of the American Museum of Natural History, lectured on "The Nature of Species" and "Patterns of Speciation" (January 15-17). Later in the spring, Alfred S. Romer, Museum of Comparative Zoology, Harvard, will deliver a series of lectures on "Evolution and Paleontology."

The University of Missouri has opened a new unit in its Chemistry Department building program. During the opening ceremonies J. H. Mathews, University of Wisconsin, spoke on the application of scientific methods to criminal identification, and Earl A. Long, University of Chicago, spoke on the superfluid properties of Helium II.

The Department of Defense is organizing a committee on educational planning, to be headed by J. J. O'Donnell, currently Chief of Information and Education. The committee will attempt to define departmental needs at college and university levels and to work with educational institutions in having these needs met. One of the first steps will involve a resumption of the accelerated programs of instruction that were in force during the war. It is anticipated that 85 per cent of the country's colleges and universities will again be operating on a trimester or four-quarter basis by next September.

The Daniel and Florence Guggenheim Aviation Safety Center has been established at Cornell University to foster the improvement of aviation safety through research, education, training, and the dissemination of safety studies to the industry and of air safety information to the general public. Headquarters are in New York City, in space provided by the



Institute of the Aeronautical Sciences, 2 E. 64th St.

A modern isotope laboratory has been established in the Division of Biological Chemistry at **Hahnemann Medical College and Hospital**, Philadelphia. This laboratory will foster research with isotopes in the various departments of the college and also provide facilities for the use of isotopes in clinical diagnosis and therapy. Jay S. Roth will be in charge. The clinical program will be carried out in cooperation with Samuel Geyer, of the Department of Radiology, and other hospital staff members.

MIT is offering a special program in Food Technology during the 1951 Summer Session, June 25-July 13, Mondays through Fridays. Letters of application, including appropriate details regarding experience and background, and requests for further information should be sent to Professor Walter H. Gale, Room 3-107, Massachusetts Institute of Technology, Cambridge 39, Mass.

University of Michigan scientists have been awarded a two-year AEC contract amounting to \$30,000 for the first year. The funds will be used to continue development, alteration, and operation of the 300-mev "race track" synchrotron, by means of which Michigan physicists are investigating the structure of the protons in the center of the atom. H. R. Crane, professor of physics, is directing the research.

Word has arrived from Peking indicating that the **Peking Union Medical College** has been taken over by the Chinese People's Government. This institution, established by the Rockefeller Foundation about thirty years ago, has been outstanding in the training of educational leaders and research personnel in medicine. It now becomes a "National" Medical College.

### Meetings and Elections

The first national meeting of the **International Society for General Semantics** will be held in June at the University of Chicago. Members of the society who wish to present papers should send preliminary descriptions or abstracts to Dr. Russell M. Yers, University Hospitals, State University of Iowa, Iowa City.

**Phi Sigma Biological Society** held its biennial meeting December 27-29 at the University of Denver and the University of Colorado. The following officers for 1951-52 were elected: honorary president, Harley J. Van Cleave; chancellor, Karl F. Lagler; retiring chancellor, Arthur I. Ortenburger; vice chancellor, Erwine Hall Stewart; secretary, Henry van der Schalie; treasurer, Tema Shults Clare; editor, Anselm M. Keefe.

Edward G. Budd, Jr., president of the Budd Company, and James H. Robins, president of the American Pulley Company, have recently become vice presidents of the **Franklin Institute**. A. Felix du Pont, Jr., fills the vacancy on the institute's Board of Managers created by the death of his uncle, E. Paul du Pont. Another new board member is James Creese, president of Drexel Institute of Technology.

### Recent Deaths

Otis W. Barrett (78), botanist, Clarendon, Vt., Oct. 6, 1950; L. S. Berg, geographer, Moscow, Dec. 26, 1950; Ralph R. Brady (55), lighting engineer, Livingston, N. J., Dec. 10, 1950; Guy Irving Burch (51), population analyst, Washington, D. C., Jan. 13, 1951; William Buschke (43), ophthalmologist, New York, Dec. 21, 1950; A. Benson Cannon, dermatologist, Millbrook, N. Y., Nov. 27, 1950; Sir George L. Cheatele (85), surgeon, Bushey, Hertfordshire, Eng., Jan. 2, 1951; Walter G. Clark (74), engineer, Los Angeles, Dec. 17, 1950; Lewis A. Conner (83), heart specialist, New York, Dec. 4, 1950; Robert L. Dickinson (89), gynecologist, Amherst, Mass., Nov. 29, 1950; Gösta Forssell (74), radiologist, Stockholm, Nov. 14, 1950; Philip Franklin (70), surgeon, London, Jan. 7, 1951.

L. C. Glenn (79), geologist, Nashville, Jan. 11, 1951; Benjamin Gruskin (68), pathologist, Durham, N. C., Dec. 5, 1950; Theodore S. Hart (81), heart specialist, New York, Jan. 1, 1951; Forrest R. Hughes (57), engineer, New Haven, Jan. 5, 1951; Frederic H. Lewey (65), neuroanatomist, Pennsburg, Pa., Oct. 5, 1950; A. Cressy Morrison (86), former executive of Union Carbide and Carbon Corp., Brooklyn, Jan. 9, 1951; Yoshio Nishina (61), physicist, Tokyo, Jan. 10, 1951; Harlan B. Perrins (56), gynecologist, New Haven, Nov. 9, 1950; Elsmere R. Rickard (51), public-health authority, Fort Myers, Fla., Jan. 16, 1951; Joseph F. Ritt (57), mathematics professor, New York, Jan. 5, 1951.

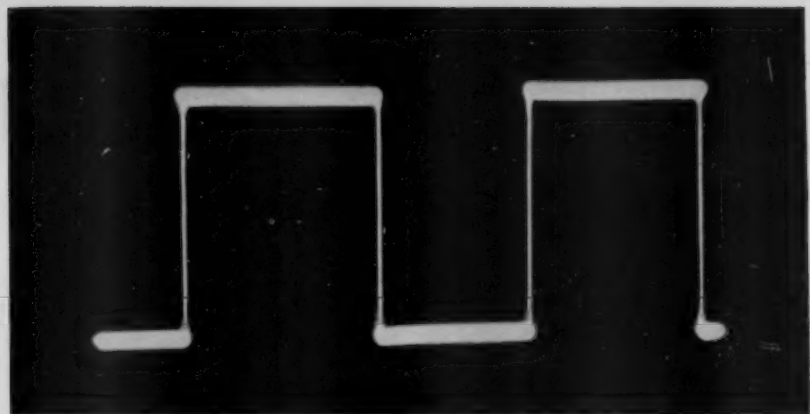
Leonard C. Sanford (82), ornithologist, Port Sewall, Fla., Dec. 7, 1950; Samuel A. Savitz (67), lung specialist, Philadelphia, Nov. 30, 1950; J. Eastman Sheehan, plastic surgeon, New York, Jan. 8, 1951; Kenneth Simpson (63), engineer, New York, Jan. 13, 1951; Robert D. Sinclair (58), agriculturist, Edmonton, Canada, Sept. 30, 1950; W. H. Stevenson (78), agriculturist, Ames, Iowa, Jan. 7, 1951; Walter R. Sweadner (47), entomologist, Pittsburgh, Jan. 13, 1951; Jean-Hyacinthe Vincent (87), epidemiologist, Paris, Nov. 23, 1950; George G. Ward (82), gynecologist, New York, Dec. 20, 1950; Francis C. Wood (81), pathologist, Englewood, N. J., Jan. 5, 1951.

### Miscellaneous

A Bureau of Labor Statistics survey has revealed that of the 42,000 scientists covered one half were employed by colleges and universities and drew a median salary of \$4,860 a year. The 27 per cent who work in private industry have a median annual salary of \$7,070, and the 13 per cent in government draw \$6,280. The other 10 per cent either are self-employed or are employed in such jobs as scientific writing.

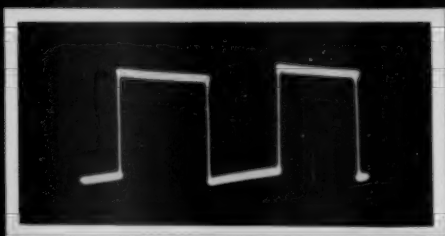
A cooperative is being organized for the purpose of exchanging stocks and information relating to **tomato genetics**. Anyone interested in joining the group should write to C. M. Rick, University of California, Davis.



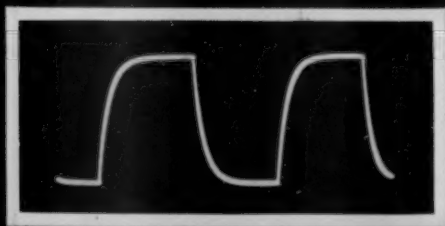


A perfect square wave, photographed by engineers of Allen B. DuMont Laboratories, Inc., at the output of a high-frequency amplifier. This is the result of repeated adjustment of a compensated attenuator and peaking coils.

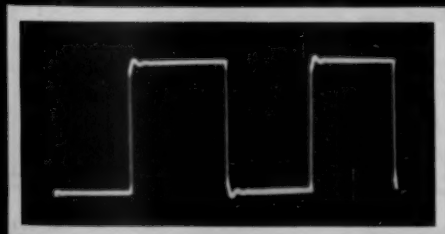
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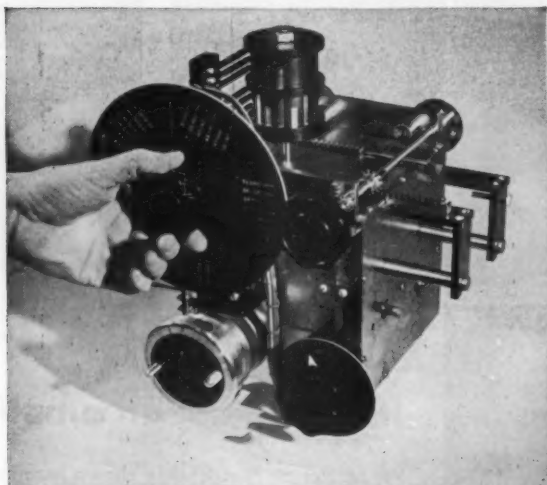
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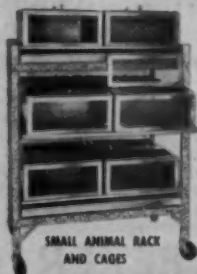
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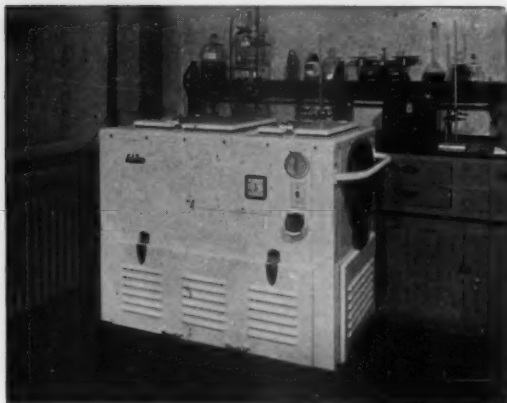
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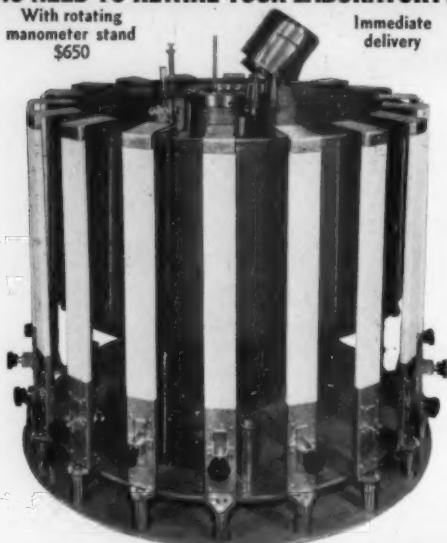
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Feb. 15; Mar. 1, 15; Apr. 5, 26. Leo M. Franklin Lectures in Human Relations. Rackham Memorial Building, Wayne University, Detroit.

Feb. 17-22. American Association of School Administrators. Atlantic City, N. J.

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Feb. 20-22. American Concrete Institute (Annual). San Francisco.

Feb. 21-22. American Pomological Society. Chase Hotel, St. Louis.

Feb. 22-24. American Orthopsychiatric Association. Book-Cadillac Hotel, Detroit.

Feb. 23-24. National Conference on Rural Health. Memphis, Tenn.

Feb. 26; Mar. 5, 12, 19; Apr. 16, 23, 30. Frontiers in Chemistry Lecture Series. Science Hall, Wayne University, Detroit.

Feb. 28. Inter-Society Color Council. Wardman Park Hotel, Washington, D. C.

Mar. 1-3. American Academy of Forensic Sciences (Annual). The Drake, Chicago.

Mar. 5-7. Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy. William Penn Hotel, Pittsburgh, Pa.

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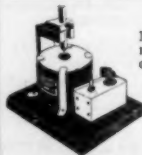
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